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Property Rights on the New Frontier: Climate Change, Natural Resource Development, and Renewable Energy

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This Article explores the history of natural resources law and pollution control law to provide insights into current efforts by states to create solar easements, wind easements and other property rights in renewable resources to help achieve climate change and energy independence goals. One challenge for developing theoretical and policy frameworks in this area is that property rights have played an important role in both natural resources law and pollution control law, and while climate change invokes both fields, the role of property rights in each is quite different. Early natural resources law was based significantly on conveying property rights in natural resources to private parties to encourage westward expansion and economic development. By contrast, pollution control law as it first developed in the 1970s was based on placing limits on such rights and creating government permit systems to meet environmental protection goals. This Article proposes that as scholars and policymakers consider approaches to developing solar and wind energy on private lands, it will be important not to rely too heavily on a traditional natural-resource development approach. Instead, this Article argues that an approach that integrates resource access into state and local permitting and land use planning frameworks may better meet development and environmental protection goals without creating new entrenched and potentially problematic property rights in natural resources. Moreover,

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because solar development and wind development on private lands present different concerns with regard to size, scale, and environmental impact, this Article suggests that solar development be structured based on private solar easement transactions within a hospitable local zoning framework while wind development be based on a statewide siting and permitting structure with less local government involvement.

INTRODUCTION

Property rights have always played a major role in the fields of natural resources law and pollution control law. Natural resources law is defined generally as statutory and common law governing the use, extraction, and preservation of natural resources. This includes the laws governing the development of coal, oil, gas, and minerals, and the use of

public grazing land, water, and timber for private economic gain and development.[1] By contrast, pollution control law generally includes the laws regulating the discharge of pollutants to air and water; hazardous and solid waste generation, disposal, and remediation; and regulation of toxic chemicals and pesticides. These laws constitute the core of the field of environmental law.[2]

Historically, the role of property rights in natural resources law has differed from the role of property rights in pollution control law. In the late nineteenth and early twentieth centuries, both the federal government as well as state governments conveyed property rights in natural resources, such as oil, gas, minerals, water, and other resources, to private parties. While current laws governing natural resource development now include major components to protect and preserve those resources for purposes other than economic gain and to preserve public lands for parks, wilderness areas, and monuments, a significant part of the historical foundation of natural resources law was to create a structure to convey property rights in natural resources to private parties to encourage westward expansion and economic development.[3] For example, the 1872 Mining Law conveyed a legally protectable property interest in minerals on public lands in order to encourage mineral development on those lands.[4] Likewise, water law in parts of the West is still based largely on the prior appropriation doctrine, which grants to the first person to divert water for a beneficial purpose a continuing property interest in the use of that water that is superior to water users who come later.[5]

By contrast, in the 1970s, the federal and state governments significantly expanded pollution control laws that limited property and resource development rights. For example, the Clean Air Act and Clean Water Act placed restrictions on the right to use and develop resources in ways that pollute public airspace and waterways, while wetlands regulations place limits on the use of private lands.[6] Such limitations on

1. *See generally* JAMES RASBAND ET AL., NATURAL RESOURCES LAW AND POLICY 80–82 (2d ed. 2009) (discussing the foundation and history of natural resources law); ERIC T. FREYFOGLE, NATURAL RESOURCES LAW 2–5 (2007) (describing natural resources law as "the expansive body of rules and processes governing the ways people interact with nature" as well as ownership of land and discrete components of nature).

2. *See* RICHARD J. LAZARUS, THE MAKING OF ENVIRONMENTAL LAW 178–81 (2004).

3. *See* ERIC T. FREYFOGLE, NATURAL RESOURCES LAW 2 (2007) (discussing role of private property rights in natural resources law); *infra* notes 57–59 (discussing role of government conveyance of property rights in natural resources to encourage westward expansion and economic development).

4. *See* JAN G. LAITOS ET AL., NATURAL RESOURCES LAW 280–81 (2002).

5. *See* GEORGE A. GOULD ET AL., CASES AND MATERIALS ON WATER LAW 7–11 (7th ed. 2005).

6. *See infra* notes 120–121.

property and development rights were politically feasible because of bipartisan support for environmental protection legislation in Congress and state legislatures, based in part on a national consensus that unregulated, or at least insufficiently regulated, resource development created a problem that required regulation to solve.

One of today's primary environmental challenges is to limit greenhouse gas (GHG) emissions to prevent climate change. In recent years, policymakers and scholars have focused on using pollution control approaches such as the Clean Air Act and cap and trade legislation to address climate change.[7] At the same time, however, there is growing consensus that a natural resource development solution, that is, the development of non-carbon-based energy sources, such as solar and wind energy, will be critical in creating a comprehensive solution to the climate change problem.[8] States and, more recently, the federal government have created incentives, funding, and programs to encourage the development and use of solar, wind, and other forms of renewable energy on public and private lands to transition to a carbon-reduced society. In effect, extracting, harnessing, and using solar, wind, and other low-carbon energy sources will likely become the new frontier of natural resources law. Despite the apparent necessity of such technologies, there is no clear model to follow toward this new frontier and no clear consensus regarding what role property rights and incentives should play. This Article explores the history of natural resources law and pollution control law to provide insights into current efforts by state and local governments to create and protect new property rights in wind and solar access in connection with developing and regulating solar and wind energy on private lands.[9] Such exploration may help scholars and policymakers create a more nuanced and informed framework for their efforts to foster the growth of renewable energy projects.

In recent years, state and local governments have in many cases adopted historical natural resource development approaches to solar and wind by defining leasehold estates, easements, and other property interests in solar and wind rights. Some states have created permitting and property conveyance frameworks for solar based on the prior appropriation doctrine that western states have historically used to

7. *See, e.g.*, John Copeland Nagle, *Climate Exceptionalism*, 40 ENVTL. L. 53, 67–68 (2010) (contending that climate change is a "pollution" concern under a broad definition of what constitutes "pollution" and that strategies for responding to climate change should include adaptation, funding new energy technologies, promoting carbon sequestration, and controlling greenhouse gases through regulatory controls under the Clean Air Act and new GHG legislation).

8. *See infra* notes 37–38.

9. For a discussion of the important distinctions between solar and wind development on public lands and private lands, see *infra* notes 14–15 and accompanying text.

allocate water rights.[10] Other states have looked to the history of mineral development law in determining whether wind rights should be severable from surface rights in order to facilitate development of wind energy.[11] In these efforts, states are hoping to spur development and create more certainty in investment, building off the historical natural resource development model of conveying property rights in resources to private parties to achieve economic and environmental goals.[12] A primary purpose of this Article is to advocate caution in that regard and suggest that policymakers and scholars avoid hewing too closely to the natural resource development model for solar and wind, which may cause them to lose sight of the pollution control and permitting aspects of resource development that were added as an overlay to natural resources law but now should be fully integrated from the outset.

It is critically important to focus on the application of a natural resource legal model now, before new property right "expectations" develop that may in the long run hinder the protection and use of renewable resources. Professors Eric Freyfogle, Richard Lazarus, and Joseph Sax, among others, have argued persuasively that we cannot think of property interests in natural resources in the same way that we think about other types of property.[13] Instead, property interests in natural resources must be fully integrated with governmental regulation and protection of those resources. While this may seem obvious, if lawmakers create a framework for these newly-valued resources built on historical conceptions of "property rights" in traditionally extractive resources, such a framework may be difficult to change, even in the face of developing knowledge, technology, need, or resource shortages.

This Article proceeds in three parts. Part I briefly discusses climate change and explains how efforts to reduce GHG emissions cannot be

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10. *See* discussion *infra* Part III.A.1.

11. *See* discussion *infra* Part III.A.2.

12. *See id.*

13. *See, e.g.*, Richard J. Lazarus, *Shifting Paradigms of Tort and Property in the Transformation of Natural Resources Law*, *in* NATURAL RESOURCES POLICY AND LAW 193, 213–14 (1993) (exploring the changing nature of property interests in natural resources and predicting that environmental concerns and the development of pollution control laws point toward the creation of "modified, less absolute, property rights in all kinds of natural resources"); Eric T. Freyfogle, *Property and Liberty*, 34 HARV. ENV. L. REV. 75, 117 (2010) (discussing the relationship between property and liberty and arguing that "[i]ndividual rights should not guide public lawmaking, when it comes to land ownership" but instead public lawmaking "must define the scope of individual liberties"); Joseph L. Sax, *The Limits of Private Rights in Public Waters*, 19 ENVTL. L. 473, 481–83 (1989) (arguing that history of water law establishes that rights in water are not like "more personal, more fully-owned property" and are subject to public authority without compensation); J. Peter Byrne, *Property and Environment: Thoughts on an Evolving Relationship*, 28 HARV. J.L. & PUB. POL'Y 679, 682–83 (2004–05) (stating that the "[e]cological consciousness and environmental concern have transformed how we think about property" and that "environmental regulations appear to be a part of the property system, rather than external to it").

based solely on pollution control measures, but instead must rely on enhanced natural resource development to create additional sources of renewable energy. It then summarizes existing federal and state incentive programs to spur solar and wind development and explains why these efforts, on their own, may be insufficient to meet renewable energy goals. Part II turns squarely to solar and wind development and how development of these renewable resources compares and contrasts with historical natural resource development. It first explains why solar and wind can be considered natural resources akin to water, minerals, or traditional energy-producing resources. It then explores the foundation of property rights and development rights in natural resources law and pollution control law. It tracks how these fields evolved in response to the modern environmental movement, when courts and legislatures replaced the historical dominance of resource development rights over other competing rights with federal, state, and local permitting frameworks. It then explains the problem this Article attempts to address—namely that some states, with support from a number of legal scholars, seem to be following a historical natural resource development model, particularly the prior appropriation doctrine from water rights law, in their efforts to spur renewable energy development—and the potential drawbacks of such an approach. Part III then looks at property rights on the "new frontier" of natural resource development. It first explores state efforts to define property rights in solar and wind access and related state and local efforts to create comprehensive permitting programs. It proceeds to provide insight into how we can learn from our past debates over property rights to create an approach to solar and wind energy that can build on modern regulatory and permitting frameworks.

This Article concludes that scholars and policymakers should be cautious in grounding solar and wind development on historical natural resource development models such as prior appropriation or other methods that create entrenched property rights in natural resources. Instead, development and environmental protection interests are likely to be better served if property interests in solar or wind are integrated into various levels of government regulation based on the size and scope of the project.

Moreover, this Article proposes a different regulatory approach for solar than it does for wind. In the context of solar development, private transactions regarding solar property rights within a regulatory framework that eliminates existing local barriers to development may be appropriate for the smaller-scale, neighborhood development that represents a significant portion of solar development on private lands today. Wind, by contrast, poses greater potential conflicts with other natural resources, as it is more likely to be developed on a larger scale than solar. These differences advocate for a statewide permitting

approach for wind development. Ultimately, this Article attempts to take the best of both the natural resource development model and the pollution control model and adapt them to current solar and wind development needs.

It is important to note that this Article focuses only on solar and wind development on private lands and does not address such development on public lands. This is not because solar and wind development on public lands is insignificant. Indeed, projects like Cape Wind off the coast of Massachusetts and large-scale solar projects proposed for the Mojave Desert are significant both in terms of their potential for large-scale renewable energy development as well as for the controversy they have created.[14] The legal and policy issues surrounding solar and wind development on public lands, however, are sufficiently different in terms of size, impact, transmission challenges,[15] and the role of the federal government to require separate treatment beyond the scope of this Article. By focusing here on solar and wind development exclusively on private lands, this Article is able to more fully address the property rights, land use, and other statutory and regulatory issues

14. *See* Todd Woody, *Desert Showdown: Big Solar v. Little Wildlife*, GREEN WOMBAT (March 26, 2009), http://thegreenwombat.com/2009/03/26/desert-showdown-over-big-solar-projects; Todd Woody, *Desert Vistas v. Solar Power*, N.Y. TIMES (Dec. 21, 2009), http://www.nytimes.com/2009/12/22/business/energy-environment/22solar.html; *see also* Ten Taxpayers Citizen Grp. v. Cape Wind Assocs., 373 F.3d 183 (1st Cir. 2004) (finding, in context of federal authority over approvals for Cape Wind project, that Congress had "retained for the federal government the exclusive power to authorize or prohibit specific uses of the seabed beyond three miles from shore"); Alliance to Protect Nantucket Sound, Inc. v. U.S. Dep't of the Army, 288 F. Supp. 2d 64 (D. Mass. 2003) (confirming authority of U.S. Army Corps of Engineers to put the tower in place for Cape Wind project); Town of Barnstable v. Cape Wind Assocs., 2010 WL 2436837 (Mass. Super. Ct. 2010) (finding that the Secretary did not act in an arbitrary and capricious manner in issuing a final environmental impact report certificate because "[t]he Secretary's failure to analyze the potential impacts of the Wind Farm was rationally based on a legally correct determination that MEPA jurisdiction over the Project does not extend into federal waters"); John Copeland Nagle, *See the Mojave!*, 89 OR. L. REV. (forthcoming 2011) (discussing recent disputes over solar development in the Mojave desert); Beth Daley, *Two Tribes Object to Cape Wind Turbines*, BOSTON.COM (Oct. 26, 2009), http://www.boston.com/lifestyle/green/articles/2009/10/26/2_tribes_object_to_cape_wind_turbines; *Secretary Salazar Announces Approval of Cape Wind Energy Project on Outer Continental Shelf off Massachusetts*, U.S. DEP'T INTERIOR (Apr. 28, 2010), http://www.doi.gov/news/doinews/Secretary-Salazar-Announces-Approval-of-Cape-Wind-Energy-Project-on-Outer-Continental-Shelf-off-Massachusetts.cfm; Press Release, U.S. Dep't of the Interior, Secretary Salazar Approves Seventh Large-Scale Solar Energy Project on U.S. Public Lands (Nov. 4, 2010), *available at* http://www.doi.gov/news/pressreleases/Secretary-Salazar-Approves-Seventh-Large-Scale-Solar-Energy-Project-on-US-Public-Lands.cfm.

15. Transmission challenges, as they relate to renewable energy, include the fact that the current structure is outdated and locally focused, which restricts the growth of renewable energy growth and use. *See* AM. WIND ENERGY ASS'N & SOLAR ENERGY INDUS. ASS'N, GREEN POWER SUPERHIGHWAYS: BUILDING A PATH TO AMERICAN'S CLEAN ENERGY FUTURE 6 (2009).

specific to such development and which, in fact, constitute most of the legislative activity to date.

I. THE POLLUTION CONTROL AND NATURAL RESOURCE DEVELOPMENT ASPECTS OF CLIMATE CHANGE

Legislation and policy addressing climate change have focused primarily on pollution control mechanisms, such as regulation under the Clean Air Act, pollution control legislation to regulate GHG emissions directly, as well as natural resource development approaches such as financial incentives and programs to develop new sources of renewable energy, particularly solar and wind.[16] This Part first briefly describes these types of regulatory and incentive-based approaches and concludes that, while such strategies yield certain benefits, they are neither sufficient to adequately combat climate change nor able to foster emerging renewable energy sources. The limitations of these approaches, however, form the backdrop of state and local government efforts to create property rights in access to solar and wind resources to further encourage development of these resources.

A. Pollution Control Approaches to Climate Change

Since President Obama took office in 2009, the U.S. Environmental Protection Agency (EPA) has for the first time used its authority under the Clean Air Act to regulate GHG emissions as a "pollutant." In April 2009, pursuant to the Supreme Court's directive in *Massachusetts v. EPA*,[17] EPA issued a proposed "endangerment" finding under the Clean Air Act that GHG emissions, including CO_2, are pollutants that threaten the public health and welfare of future generations.[18] This proposed finding was finalized in December 2009.[19] In May 2009, President Obama reached an agreement with the State of California,[20] the auto industry, nonprofits, and others to set new national emission standards, including limits on GHG emissions, for light trucks and cars.[21] In April 2010, EPA

16. *See* discussion *infra* Part I.A.

17. Massachusetts v. EPA, 549 U.S. 497 (2007).

18. *See* Proposed Endangerment and Cause and Contribute Findings under the Clean Air Act, 74 Fed. Reg. 18,886 (Apr. 24, 2009).

19. *See* Endangerment and Cause and Contribute Findings under the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009).

20. Unlike other states, which do not have authority to set auto emission standards, the State of California has special authority under the Clean Air Act to obtain preemption waivers from the federal government allowing it to set emissions standards for automobiles. *See infra* note 30.

21. *See* ENVTL. PROT. AGENCY, EPA WILL PROPOSE HISTORIC GREENHOUSE GAS EMISSION STANDARDS FOR LIGHT-DUTY VEHICLES (2009), *available at* http://www.epa.gov/otaq/climate/regulations/420f09028.pdf; Josh Vorhees & Robin Bravender, *Obama Unveils*

and the National Highway Traffic Safety Administration issued its joint final rule setting emission standards for those vehicles for model years 2012–16 and, in May 2010, President Obama directed the agencies to begin work on even more restrictive standards for model year 2017 and beyond, as well as emission standards for heavy trucks.[22] Also in 2010, EPA issued a series of proposed rules to lay the groundwork for future regulation by imposing limits on GHG emissions from stationary sources and establishing permitting requirements for these sources.[23]

Despite efforts on EPA's part to regulate GHGs with the tools that it has available, many scholars, policymakers, and regulators, including EPA, agree that the Clean Air Act is a crude tool to address climate change.[24] Because of the limits of the Clean Air Act, which was created to address traditional criteria pollutants rather than GHG emissions, federal lawmakers have attempted to enact new legislation to address climate change directly.[25] These lawmakers have focused on a hybrid approach that places limits on GHG emissions for electric utilities, oil companies, and large industrial sources, but also grants "allowances" for CO_2 emissions to these companies, which can then be bought and sold on the market. This cap and trade approach is a pollution control approach that

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Dual Standard for Fuel Economy, Emissions, GREENWIRE (May 19, 2009), *available at* http://www.eenews.net/Greenwire/2009/05/19/1.

22. *See* Final Rule, Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards, 75 Fed. Reg. 25,324 (May 7, 2010) (to be codified at 40 C.F.R. pts. 85, 86, 600; 49 C.F.R. pts. 533, 537, 538); *see also* Memorandum on Improving Energy Security, American Competiveness and Job Creation, and Environmental Protection Through a Transformation of Our Nation's Fleet of Cars and Trucks, 75 Fed. Reg. 29,399 (May 21, 2010); *Transportation & Climate: Regulations and Standards*, ENVTL. PROT. AGENCY, http://www.epa.gov/oms/climate/regulations.htm (last visited Jan. 11, 2011) (describing new rule and Obama directive for stricter standards for future years).

23. *See* Mandatory Reporting of Greenhouse Gases, 74 Fed. Reg. 56,260 (Oct. 30, 2009) (rule requiring sources above a certain threshold level (generally 25,000 metric tons of CO_2 equivalents) to report their GHG emissions); Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 Fed. Reg. 31,514 (June 3, 2010), *available at* http://www.epa.gov/nsr/actions.html (rule governing which sources will be subject to GHG permitting requirements under the Clean Air Act).

24. *See, e.g.*, Robin Bravender, *EPA Will Need Increased Climate Funding as Regs Ramp Up, Jackson Says*, N.Y. TIMES (Feb. 25, 2010), http://www.nytimes.com/gwire/2010/02/25/25 greenwire-epa-will-need-increased-climate-funding-as-reg-20989.html (reporting on EPA's request for additional congressional funding for future climate change regulatory programs even as EPA Administrator Lisa Jackson acknowledged that "a climate bill would offer more flexibility than regulations"); John C. Nagle, *Climate Exceptionalism*, *supra* note 7 ("There is widespread agreement among supporters of the application of the Clean Air Act to CO_2 that the statute offers a 'second-best solution' until a more targeted federal statute appears"); Holly Doremus & W. Michael Hanemann, *Of Babies and Bathwater: Why the Clean Air Act's Cooperative Federalism Framework Is Useful for Addressing Global Warming*, 50 ARIZ. L. REV. 799, 820–22 (2008) (suggesting that while many aspects of the CAA make it a less than ideal mechanism for addressing climate change, the Clean Air Act's cooperative federalism framework could be "a good fit for global warming").

25. *See infra* notes 28–29.

attempts to use the market to achieve desired emissions reductions. It is based on the 1990 revisions to the Clean Air Act (Title IV) that created a sulfur dioxide (SO_2) emission trading program for power plants.[26] This program established new emission limitations on SO_2 and directed EPA to allocate annual tonnage emissions allowances to power generation facilities. Many have pronounced the program quite successful in reducing SO_2 emissions faster and more economically than had been projected.[27]

Building on this approach, in June 2009 the U.S. House of Representatives passed the Waxman-Markey bill, which would have established a GHG cap and trade program as well as enacted several significant federal energy policies with the goal of reducing GHG emissions 83 percent by 2050.[28] The U.S. Senate has passed several bills out of committee, which also follow the cap and trade approach, but none of them has advanced to the full Senate floor. At this point, however, passage of any cap and trade bill out of the Senate appears unlikely for the foreseeable future.[29]

Although the federal government has only recently begun to take regulatory action on climate change, the states have been active in this area for many years.[30] In 2002, for example, California enacted legislation[31] to authorize the California Air Resources Board to develop and implement standards for GHG emissions from new motor vehicles. The agency did so in 2004,[32] numerous other states adopted those regulations,[33] and, after years of conflict and litigation with the Bush

26. *See generally* J.B. RUHL ET AL., THE PRACTICE AND POLICY OF ENVIRONMENTAL LAW 240–45 (2d ed. 2010) (discussing Clean Air Act SO_2 trading program and congressional efforts to establish a GHG cap-and-trade program).

27. *See id.*

28. *See* American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (2009), *available at* http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_cong_bills&docid=f:h2454eh.txt.pdf.

29. *See* Clean Energy Jobs and American Power Act, S. 1733, 111th Cong. (2009) ("Kerry-Boxer bill"), *available at* http://kerry.senate.gov/cleanenergyjobsandamericanpower/intro.cfm; American Power Act, Discussion Draft, 111th Cong. (2010) ("Kerry-Lieberman bill"), *available at* http://kerry.senate.gov/imo/media/doc/APAbill3.pdf; *see also* Juliet Eilperin & Steven Mufson, *Obama Shifting Climate Strategy After GOP Gains*, WASH. POST, Nov. 5, 2010, at A3 (indicating that the commonly held view since the 2010 mid-term elections is that the Obama cap and trade legislation "is not the only way," and describing the President's plan to abandon convincing lawmakers of the importance of global warming).

30. *See, e.g.*, Alexandra B. Klass, *State Innovation and Preemption: Lessons from State Climate Change Efforts*, 41 LOY. L.A. L. REV. 1653, 1688–90 (2008) (discussing state and regional climate change efforts).

31. Assemb. B. 1493, 2001–02 Leg. (Cal. 2002) (codified as CAL. HEALTH & SAFETY CODE § 43018.5 (2003)).

32. Cal. Air Res. Bd. Exec. Order No. G-05-061 (Aug. 4, 2005), 39-Z Cal. Reg. Notice 1427–28 (Sept. 30, 2005); *see also* CAL. CODE REGS. tit. 13, §§ 1900, 1961, 1961.1 (2006).

33. *See, e.g.*, Ariz. Exec. Order No. 2006-13 (Sept. 7, 2006); Fla. Exec. Order No. 07-127 (July 13, 2007); Wash. H.B. 1397, 59th Sess. (2005) (enacted).

administration over whether California was entitled to a preemption waiver for those rules under the Clean Air Act, President Obama granted the waiver in 2009.[34] On a broader scale, California legislation requires the state to reduce GHG emissions to 1990 levels by 2020,[35] and several groups of states within different regions of the country have set caps on CO_2 emissions from power generators.[36]

Policy makers and scholars recognize, however, that a solution modeled exclusively on a pollution control approach, even one coupled with advances in energy efficiency,[37] will be insufficient to address the problem of climate change without a radical restructuring of modern society.[38] Because it is likely that society will continue to drive cars and use electricity at least near today's levels, it is imperative that we develop replacements for oil, gas, and coal on a national and, indeed, a worldwide basis. One method is for policy makers to impose stringent limits on GHG emissions and force power plants and other industrial facilities to develop the technology necessary to meet those limits. In many ways, the technology-forcing provisions of the Clean Air Act and the Clean Water Act were designed with that approach in mind. But even those provisions ensured that the limits were tied to technologies that were economically or practically feasible for the industry.[39] Today, without the excitement and momentum surrounding environmental protection that existed in the early 1970s, it appears unlikely that any significant cap on GHG

34. *See* Klass, *supra* note 30, at 1691–92 (discussing litigation over California waiver request); Notice of Decision Granting a Waiver of the Clean Air Act Preemption for California's 2009 and Subsequent Model Year Greenhouse Gas Emission Standards for New Motor Vehicles, 74 Fed. Reg. 32,744, 32,746–47 (July 8, 2009) (describing history of California waiver request); ENVTL. PROT. AGENCY, TRANSPORTATION AND CLIMATE, CALIFORNIA GREENHOUSE GAS WAIVER REQUEST (June 30, 2009) (announcing that the agency granted California's waiver request on June 30, 2009), *available at* www.epa.gov/otaq/climate/ca-waiver.htm.

35. California Global Warming Act of 2006, CAL. HEALTH & SAFETY CODE §§ 38500–38599 (2007).

36. *See* Klass, *supra* note 30, at 1688–90 (describing state legislation); *see, e.g.*, REG'L GREENHOUSE GAS INITIATIVE, www.rggi.org/home (last visited Jan. 11, 2011); W. CLIMATE INITIATE, www.westernclimateinitiative.org (last visited Jan. 11, 2011); MIDWESTERN GREENHOUSE GAS REDUCTION ACCORD, www.midwesternaccord.org (last visited Jan. 11, 2011).

37. *See generally* Alexandra B. Klass, *State Standards for Nationwide Products Revisited, Federalism, Green Building Codes, and Appliance Efficiency Standards*, 34 HARV. ENVTL. L. REV. 335 (2010) (describing federal programs and standards to reduce energy use and GHG emissions from buildings and appliances).

38. *See, e.g.*, Steven Pacala & Robert Socolow, *Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies*, 305 SCIENCE 968, 969 (2004) (recognizing energy efficiency as an important part of reducing GHG emissions but insufficient on its own to address climate change).

39. *See* ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 143–44, 264 (6th ed. 2009) (examples of technology-based regulations in environmental statutes).

emissions will be enacted without the existence of readily-available renewable energy sources to replace conventional fuels. Accordingly, once the focus turns from attempting to limit pollution from existing energy sources to incentivizing the development of new energy sources, it becomes critical to consider the benefits and drawbacks to the various tools governmental entities have available to meet these goals. Subpart B considers one of those tools, namely, financial incentives and grants for private companies to develop renewable energy.

B. Financial Incentives to Encourage Development of Renewable Energy

Along with the pollution control strategies described in the prior subpart, the federal government and the states have adopted legislation and created programs to encourage the development of renewable energy sources, particularly solar and wind.[40] These programs are critical in efforts to address GHG emissions from the electric power sector, which constituted approximately 42 percent of U.S. CO_2 emissions from fossil fuel combustion and 34 percent of total GHG emissions in the United States in 2007.[41] Indeed, coal remains the dominant emission source in this sector, accounting for 81 percent of CO_2 emissions resulting from the generation of electric power in 2009.[42] Thus, the electric power sector is one of the most important arenas in addressing climate change. Just like current pollution control efforts, current government incentive programs will likely be insufficient on their own to fully address the problems posed by the electric power sector, but these programs will remain a key part of efforts to reduce dependence on fossil fuels.[43]

Both the federal government and the states have focused on creating incentive programs and directing funding to encourage the development of renewable energy. The American Recovery and Reinvestment Act of 2009 (ARRA) allocated over $16 billion to the U.S. Department of Energy (DOE) to invest in renewable and other clean energy technologies.[44] The federal government administers financial assistance agreements,[45] cooperative agreements,[46] and direct loans[47] to a variety of

40. *See, e.g.*, U.S. DEP'T OF ENERGY, CLEAN ENERGY FOR AMERICA'S FUTURE (2010) (discussing federal Office of Energy Efficiency and Renewable Energy's investment in wind, solar, biomass, and hydropower).

41. *See* ENVTL. PROT. AGENCY, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2007, at ES-9, ES-16 (2009), *available at* http://www.epa.gov/climatechange/emissions/downloads09/GHG2007entire_report-508.pdf.

42. *See* U.S. ENERGY INFO. ADMIN., *Where Greenhouse Gases Come From, available at* http://www.eia.doe.gov/energyexplained/index.cfm?page=environment_where_ghg_come_from.

43. *See* Pacala & Socolow, *supra* note 38, at 969.

44. *See* American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 140–41 (2009).

45. *See* 31 U.S.C. § 6304 (2006).

parties (states, industries, individuals) for a variety of purposes. For instance, the DOE administers the Loan Guarantee Program, which provides loan guarantees for projects that include, among others, biomass, hydrogen, solar, wind, and hydropower.[48] Congress first established the program under the Energy Policy Act of 2005 and later expanded it through the ARRA.[49] Likewise, the Energy Policy Act of 2005 created Clean Renewable Energy Bonds (CREBs) to finance public sector renewable energy projects, and the ARRA provided for $1.6 billion in new CREBs to finance wind, biomass, hydropower, and other renewable energy projects.[50]

In addition, states have created a variety of programs to incentivize the development of renewable energy. More than twenty states have created personal and corporate tax credits for installing wind, solar, or other renewable energy systems.[51] As of May 2010, over 20 states and the District of Columbia had enacted renewable portfolio standards (RPSs), requiring that electricity providers obtain a minimum percentage of their power from renewable energy resources by a certain date or, in some states, pay alternative compliance payments (ACPs) as a penalty.[52] For example, California requires 33 percent by 2030, and New York requires 24 percent by 2013.[53] Together, states that have enacted such standards produce more than half of the electricity sales in the United States.[54] This focus on renewable energy has resulted in the development of markets for renewable energy credits or certificates (RECs), which allow electricity consumers, utilities, and others to purchase "green power" without regard to the specific source or location of generation. Some states also allow utilities to purchase RECs to satisfy their RPS requirements.[55]

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46. *See* 31 U.S.C. § 6305 (2006).

47. *See* 42 U.S.C.A. § 17012 (West 2009).

48. *See* Craig M. Kline, *Solar*, *in* THE LAW OF CLEAN ENERGY (Michael Gerrard ed., forthcoming 2011).

49. *See* 42 U.S.C.A. §§ 16511–16514 (West 2010); American Recovery and Reinvestment Act of 2009 tit. IV, Pub. L. No. 111-5, 123 Stat. 140–41 (2009); Kline, *supra* note 48.

50. *See* Energy Policy Act, Pub. L. No. 109-58, 119 Stat. 594 (2005); American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, § 1111, 123 Stat. 115, 322 (2009); Kline, *supra* note 48.

51. *See Financial Incentives for Renewable Energy*, U.S. DEP'T OF ENERGY, http://www.dsireusa.org/summarytables/finre.cfm (last visited Jan. 11, 2011).

52. *See States with Renewable Portfolio Standards*, U.S. DEP'T OF ENERGY, http://apps1.eere.energy.gov/states/maps/renewable_portfolio_states.cfm#chart (last visited Jan. 11, 2011) (listing states and percentages); Kline, *supra* note 48.

53. *See States with Renewable Portfolio Standards*, *supra* note 52 (referencing Cal. Executive Order No. S-21-09 (Sept. 15, 2009); Retail Renewable Portfolio Standard, Case 03-E-0188 (N.Y. Pub. Serv. Comm'n Sept. 24, 2004)).

54. *See id.*

55. *See* Kline, *supra* note 48.

Despite the ARRA and other incentives, however, some contend that a greater focus on property rights and creating a natural resource development model for solar and wind access is necessary. They argue that, in the absence of a property rights-based model for solar and wind, investors, resource development companies, and even homeowners will be uncertain about their long-term ability to rely on their rights to the wind or solar resource.[56] Part II explores the history of property interests in natural resources. Part III then shows how state and local governments are relying on this history to create property interests in today's renewable resources and the benefits and problems associated with this reliance.

II. FOUNDATIONS: THE ROLE OF PROPERTY RIGHTS IN NATURAL RESOURCES LAW AND POLLUTION CONTROL LAW

In attempting to both encourage and regulate solar and wind development in their jurisdictions, states and local governments have in some cases explicitly and in other cases implicitly drawn on the models of the past—namely those surrounding early natural resource development law and modern-day pollution control law. Notably, property rights have played an important role in the development of both models. Because the fields of natural resources law and pollution control law arose during very different cultural and economic eras in United States history, however, the role of property rights in each field is quite different.

Much of natural resources law first developed during the nineteenth century, when it was a national goal to build an economy based on westward expansion and exploitation of the country's seemingly endless natural resources.[57] To do this, state and federal governments often relied

56. *See, e.g.*, Sara C. Bronin, *Solar Rights*, 89 B.U. L. REV. 1217, 1223 (2009) (arguing that the country's failure to create a solar rights regime "has dampened investment in domestic solar collectors" because "it is difficult to justify substantial up-front investment in solar collectors without a guarantee of solar access"); Alan Alexander, *The Texas Wind Estate: An Argument for the Recognition of the Wind as a Natural Resource and a Severable Property Interest*, U. MICH. J.L. REFORM (forthcoming), *available at* http://ssrn.com/abstract=1584346 (arguing that investment in wind energy in Texas is limited by legislative and judicial failure to define and protect property interests in wind estates).

57. *See, e.g.*, GEORGE CAMERON COGGINS ET AL., FEDERAL PUBLIC LANDS AND RESOURCES 52 (6th ed. 2007) (describing early national public lands policy as a "relentless march to the west," and that the national policy for most of the nineteenth century "was to sell or give away the public lands to individuals, corporations, and states in order that the nation would be tamed, farmed, and developed"); Robert Fischman, *What Is Natural Resources Law?*, 78 U. COLO. L. REV. 717, 731–33 (2007) (describing natural resources law as primarily about extraction and primary production of goods and services and stating that "natural resources are largely fodder for transformation, and their value is principally utilitarian in what they will serve in their next incarnation"); *see also* United States v. Locke, 471 U.S. 84 (1985) ("From the enactment of the general mining laws in the 19th century until 1976, those who sought to make

on property law to convey rights to private parties in minerals, oil and gas, land, and water, in order to encourage expansion and economic development.[58] State and federal courts did their part by elevating these resource development rights over competing property rights of neighbors and others when disputes arose.[59]

In contrast, by the time of the environmental movement of the 1970s, the country as a whole recognized its resources were far from unlimited and that unfettered natural resource development and economic expansion were adversely impacting air, water, land, and other natural resources. As a result, the pollution control laws that make up the core of the field of environmental law focus on prescribing limits on natural resource development and property rights, such as limits on air pollution, water pollution, waste disposal activities, and land disturbance, even if those prescribed limits interfere with pre-existing rights to natural resource exploitation.[60]

The dichotomy between early natural resources law and modern pollution control law comes with large caveats. First, natural resources law, even in the early days, was never solely about exploitation of resources but also encompassed retention of federal lands for national parks and monuments and large land grants to the states, which in turn regulated and used those lands and resources for their own public purposes.[61] Second, even as early as the late nineteenth century, federal and state policymakers began implementing conservation and preservation mandates into the management of public lands, national forests, and other natural resources.[62] Third, while natural resources law may rest in part on a foundation of property law, many scholars have noted that its contemporary focus on administrative law and regulations, ecosystem management, and preservation has transformed the field so it much more closely resembles that of environmental law.[63]

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their living by locating and developing minerals on federal lands were virtually unconstrained by the fetters of federal control.").

58. *See* COGGINS ET AL., *supra* note 57, at 52.

59. *See infra* notes 96–102, 112–17 and accompanying text.

60. *See* LAZARUS, *supra* note 2, at 179–81 (discussing differences between natural resources law and pollution control laws with natural resources law based on property law and pollution control law based on tort-law limits on exercise of property rights).

61. *See, e.g.*, CHRISTINE A. KLEIN ET AL., NATURAL RESOURCES LAW: A PLACE-BASED BOOK OF PROBLEMS AND CASES 288–89 (2d ed. 2009) (discussing the Forest Service Organic Act, 16 U.S.C. §§ 473–478, 479–482, 551, and the work of key federal forest officials in the late nineteenth century as early efforts to set aside forest reserves and preserve and protect forest resources); *infra* notes 125–38 and accompanying text (discussing cases in the late nineteenth and early twentieth centuries where courts used the common law to protect environmental resources in the face of natural resource development pressures).

62. *See* KLEIN, *supra* note 61.

63. *See* LAZARUS, *supra* note 2, at 180 (discussing how natural resources law and pollution control law have become more alike over the past three decades).

Despite these admitted caveats, this Article seeks to highlight the still-important aspects of natural resources law that rest on the conveyance of property rights.[64] Indeed, it is precisely this aspect of natural resources law that some lawmakers and scholars now embrace in their efforts to develop renewable resources.[65] A better understanding of this history is therefore important to avoid repeating past mistakes in current efforts to develop new energy sources.

Subpart A explains why solar and wind development are sufficiently similar to traditional natural resources to make the history of such resources relevant to the present analysis. Subpart B describes the nation's history of conveying property rights in natural resources by analyzing legislation and case law in the early days of natural resources law. Subpart C explores the rise of the environmental movement of the 1970s and the subsequent legislative and judicial limits placed on property rights in order to enact pollution control goals. Subpart D then discusses how the natural resource development model and pollution control model have converged in certain aspects, but how the property rights foundation of natural resources law continues to remain significant. It then previews how some legislators and scholars are relying heavily on a historical property rights and natural resource development approach in creating new frameworks for solar and wind, and the potential drawbacks to such an approach.

A. Solar and Wind Energy As Natural Resources

Any study of natural resources law reveals themes of resource acquisition, conveyance, access, and scarcity.[66] For decades, natural resources scholars and students have studied the regulation of coal, water, timber, and other energy-producing resources using these metrics. Until recently, though, solar and wind resources have not received any real focus in the study of natural resources. Now, however, as policymakers and the public turn to these renewable resources, it is important to consider as an initial matter whether it is even appropriate to look to the historical regulation of natural resource development as a model. This requires exploring the parameters of traditional natural resources and whether solar and wind also fit within those parameters.

64. *See, e.g.*, Fischman, *supra* note 52, at 746–48 (arguing for recognizing the continuing distinctions between natural resources law and environmental law and stating that "the property law foundation" of natural resources law "continues to provide an important contrast with environmental law").

65. *See* discussion *infra* Part III.A.

66. *See, e.g.*, FREYFOGLE, *supra* note 3, at 2–3; LAITOS ET AL., *supra* note 4, at 1; JAMES A. RASBAND ET AL., NATURAL RESOURCES LAW AND POLICY 36–38 (2d ed. 2009).

First, a wide variety of government and non-government bodies define natural resources broadly. Webster's Third New International Dictionary defines "natural resources" as "capacities . . . or materials (as mineral deposits and waterpower) supplied by nature."[67] Black's Law Dictionary defines the term as "any material from nature having potential economic value or providing for the sustenance of life, such as timber, minerals, oil, water, and wildlife."[68] According to the U.S. Geological Survey, "[t]he Nation's natural resources include its minerals, energy, land, water, and biota."[69] For purposes of recovering natural resources damages under various federal statutes, natural resources are defined as "land, fish, wildlife, biota, air, water, ground water, drinking water supplies and other such resources" belonging to or managed by various governmental entities and Indian tribes.[70] State environmental rights statutes, which allow private citizens to sue to protect natural resources from destruction, also define the term broadly. For instance, Minnesota defines natural resources as including but not limited to "all mineral, animal, botanical, air, water, land, timber, soil, quietude, recreational and historical resources."[71] The International Energy Agency includes solar and wind energy within its definition of "renewable energy," which is energy "derived from natural processes that are replenished constantly."[72] Thus, under a wide variety of definitions, solar and wind resources appear to fall squarely within the realm of "natural resources."[73]

Apart from legal and dictionary definitions, solar and wind resources are functionally similar to traditional energy-producing natural resources. Solar and wind resources, like water, coal, oil, and gas, derive from nature and, when subject to human effort and technology, can be channeled to produce electricity and other forms of energy. Moreover, solar and wind, like traditional forms of energy, require access to the resource. Solar and wind developers regularly acquire wind easements and solar easements from private parties to ensure they will continue to have unfettered

67. WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 1127 (2002).

68. BLACK'S LAW DICTIONARY 1127 (9th ed. 2009).

69. U.S. GEOLOGICAL SURVEY, RECENT HIGHLIGHTS—NATURAL RESOURCES (1997), *available at* http://www.usgs.gov/themes/FS-010-97/FS-010-97.pdf.

70. *See* 40 C.F.R. § 300.5 (2009).

71. MINN. STAT. § 116B.02 (2010).

72. INT'L ENERGY AGENCY, RENEWABLE ENERGY . . . INTO THE MAINSTREAM (2002), *available at* http://www.iea.org/textbase/nppdf/free/2000/Renew_main2003.pdf.

73. *See also* Alexander, *supra* note 56 (arguing that wind meets the definition of a natural resource under Texas law and should be considered as such); Sara C. Bronin, *Modern Lights*, 80 U. COLO. L. REV. 881, 882 (2009) (stating that it is "curious that a natural resource as valuable as sunlight . . . remains almost entirely unregulated in the United States"); *Generating Electricity from the Wind*, AM. ELECTRIC POWER, http://www.aep.com/environmental/education/wind/generating.aspx (last visited Jan. 11, 2011) ("Wind is considered renewable energy—a natural resource that is constantly replenished and never runs out.").

access to those resources without the risk of neighbors blocking that access by erecting buildings or growing vegetation in the case of solar or by constructing upwind turbines in the case of wind.[74] These same concerns over competing uses drove the reasonable use and prior appropriation doctrines in the field of water rights to ensure a steady source of water for agriculture and other industry, and the common law doctrine holding that where surface rights and mineral rights are in "split estate" (owned by different parties), the mineral estate is "dominant" over the surface estate, thus granting the mineral estate owner rights to use the surface in order to access the minerals.[75]

One might argue, however, that one of the key hallmarks of a natural resource is that it is scarce, thus requiring property rights and regulatory systems to govern the resource, and that wind and solar are not scarce resources in the same way as coal, oil, gas, or gold.[76] Indeed, at least one natural resources law textbook states that although natural resources exhibit a wide variety of characteristics, they all have in common that they are not produced in the first instance by humans and that they are physically scarce.[77] While this may call into question efforts to look to the history of traditional natural resource allocation as a means of governing solar and wind, important similarities remain. Even if solar and wind resources are not scarce in the sense that we run the risk of "running out" of the resource (at least using current technologies), there is potential scarcity surrounding the ability to *access* these resources for maximum energy production.[78] As a result, even though solar and wind differ from traditional resources in that they are not "scarce" as an absolute matter, the challenges surrounding continued access to the resource are the same whether the resource is water, oil, gas, coal, solar, or wind, thus making the historical development of the use and regulation of traditional resources of interest in today's current focus on solar and wind resources.

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74. *See, e.g.*, Troy Rule, *A Downwind View of the Cathedral*, 46 SAN DIEGO L. REV. 207 (2009) (discussing conflicts between upwind and downwind turbines); discussion *infra* Part III.A.1 (discussing conflicts between solar collection system owners and neighbors with buildings or vegetation that may block the solar collection systems).

75. *See* Alexandra B. Klass, *The Frontier of Eminent Domain*, 79 U. COLO. L. REV. 651, 656 (2008) (discussing historic dominance of the mineral estate over the surface estate).

76. *See* JAN G. LAITOS ET AL., NATURAL RESOURCES LAW 4 (2004); Troy A. Rule, *Shadows on the Cathedral: Solar Access Laws in a Different Light*, 2010 U. ILL. L. REV. 851, 861–62 (2010) (stating that sunlight, in contrast to water, oil, gas, or minerals, is not sufficiently "scarce" to warrant property right protection in the same way as traditional natural resources, but that exclusive *access* to sunlight radiating onto a specific location is scarce, thus warranting some form of property right protection).

77. *See* LAITOS ET AL., *supra* note 4, at 4.

78. *See supra* note 56 (discussing access).

B. *Natural Resources Law Foundations: Conferring Rights for Resource and Economic Development*

Mineral development and water rights provide an important backdrop to further treatment of solar and wind resources for at least three reasons. First, the legal history surrounding the development of these resources, more so than other resources, highlights the manner in which legislatures and courts created a property rights regime to encourage resource development to further economic development. States and scholars are looking to this history in current efforts to promote development of solar and wind power.[79] Second, legislatures and courts often relied on a property rights regime to create fairly rigid entitlements for holders of mineral development and water rights even in the face of competing property interests or environmental protection needs. This balance in favor of property rights and resource development did not change significantly until the rise of the environmental movement and enactment of the pollution control statutes in the 1970s.[80] This should serve as a caution to those who would rely too heavily on a property rights regime to spur solar and wind development. Third, the laws surrounding mineral development and water rights provide an important backdrop for considering renewable energy development because, like solar and wind resources, mining and water resources require parties who wish to use those resources to obtain initial access to the resource, ensure that others do not interfere with that access, and, often, look to legislative bodies and courts to protect that access. As a result, the early development of mineral rights and water rights in this country provides both instruction and caution in current efforts to move forward with solar and wind development.

1. *Granting and Protecting Property Rights in Mineral Development*

The federal government, states, and courts have long conveyed and protected property rights in minerals in order to develop the West, encourage energy development, and expand the economy. Indeed, the U.S. government has conveyed property interests in minerals since the founding of the country. After the revolutionary war, the former colonies gave up western territories under their control to the federal government, creating the first federal public domain.[81] For many years, however, Congress had no actual policy regarding minerals in its reserved lands.[82]

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79. *See supra* note 146 (citing articles attempting to compare solar and wind development to mineral and water development); *infra* notes 170–71 (discussing legislative efforts to model solar access on mineral or water frameworks).

80. *See* discussion *infra* Part II.C.

81. *See* JAN LAITOS ET AL., NATURAL RESOURCES LAW 316 (2006).

82. *See* JOHN LESHY, THE MINING LAW: A STUDY IN PERPETUAL MOTION 9–10 (1987).

Indeed, in 1848, at the time of the Treaty of Guadalupe Hidalgo and the gold rush, no federal mining laws were in place. As a result, each camp established its own set of rules that were based primarily on Mexican mining laws, and these rules gave miners the right to mine on public land, although to do so was technically a trespass.[83]

In 1866, Congress finally took action and passed the Lode Mining Act of 1866.[84] This law opened the public lands for exploration, declaring "the mineral lands of the public domain . . . are hereby declared to be free and open to exploration and occupation."[85] The Placer Act of 1870[86] amended the 1866 law by allowing for patenting of placer claims that were to follow the same rules and procedures as the patenting of lodes under the 1866 Act.[87] Two years later, the Mining Law of 1872[88] amended the 1866 and 1870 Acts, including the additional specification that only "valuable mineral deposits" were "free and open to exploration and purchase."[89] The Mining Law of 1872 remains in effect today and is still discussed in court cases.[90] In one such case, the court noted the connection between mineral development and property rights, stating:

> [I]ndividuals were encouraged to prospect, explore and develop the mineral resources of the public domain through an assurance of ultimate private ownership of the minerals and the lands so developed. The system envisaged by the mining law was that the prospector could go out into the public domain, search for minerals and upon discovery establish a claim to the lands upon which the discovery was made . . . . The locator thus obtained "the exclusive right of possession and enjoyment of all the surface included within the lines of their locations". . . . The claimant could apply for a patent to the land under 30 U.S.C. § 29, and, upon meeting the statutory requirements, would be granted a patent which usually conveyed the full fee title to the land.[91]

Under the Mining Law of 1872, states could supplement the federal rules and regulations so long as the state laws did not conflict with the federal laws.[92] Many states adopted regulations, including requiring

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83. *See* 1 CURTIS LINDLEY, A TREATISE ON THE AMERICAN LAW RELATING TO MINE AND MINERAL LANDS WITHIN THE PUBLIC LAND STATES AND TERRITORIES AND GOVERNING THE ACQUISITION AND ENJOYMENT OF MINING RIGHTS IN LANDS OF THE PUBLIC DOMAIN 62–64 (1903).

84. Lode Mining Act of 1866, 39th Cong. ch. 255, 14 Stat. 251 (1866).

85. *Id.* § 1.

86. Placer Mining Act of 1870, ch. 235, 16 Stat. 271 (1870).

87. *See* ROBERT SWENSON, 1 AMERICAN LAW OF MINING: SOURCES AND EVOLUTION OF AMERICAN MINING LAW 51 (Rocky Mountain Mineral Law Found. ed., 1980).

88. Mining Law of 1872, 30 U.S.C. §§ 22–24, 26–28, 29–30, 33–35, 37, 39–42, 47.

89. *Id.* at 53.

90. *See id.*

91. United States v. Curtis-Nevada Mines, Inc., 611 F.2d 1277, 1281 (9th Cir. 1980).

92. *See* SWENSON, *supra* note 87, at 62.

discovery shafts, recording of mining claims, as well as requiring a posting of notice of location.[93] The importance placed on mining can be seen in state statutes such as California's Possessory Act (1852), which gave miners preference to land previously used for agricultural purposes,[94] and Indiana's Mineral Lapse Act (1976), which extinguished mineral interests that were unused for twenty years in order to encourage mineral development.[95] Thus, both federal and state mining statutes encouraged extraction of mineral resources in order to promote economic growth and development.

When disputes between mining interests and other interests arrived in court in the late nineteenth and early twentieth centuries, judges frequently favored the ownership and development of mineral interests for economic gain as a matter of common law. In these cases, courts often protected the rights of mining interests to pollute the lands of others in order to develop mineral interests.

For instance, in 1886, in *Pennsylvania Coal Co. v. Sanderson*, the Pennsylvania Supreme Court upheld the right of a mining company to run water through its mine and then discharge the contaminated water into a stream, adversely affecting fish and downstream landowners.[96] When the downstream landowners sued to prevent the discharge of contaminated water, the court held for the mining company, stating that the plaintiff's grievance was "for a mere personal inconvenience" which "must yield to the necessities of a great public industry, which although in the hands of a private corporation, subserves a great public interest."[97] The court further stated that it was critical to "encourage the development of great natural resources of a country" and that "[t]he population, wealth, and improvements" in the area were "a result of mining, and of that alone."[98] Likewise, in 1855, in *Wheatley v. Baugh*, the Pennsylvania Supreme Court upheld the right of a mining company to divert a subterranean spring to the detriment of a tenant tannery

93. *See id.* at 63.

94. *See* CAL. GEN. L. § 6790 (1850–64).

95. IND. CODE §§ 32-5-11-1 to -5-11-8 (1976); *see* Texaco v. Short, 454 U.S. 516, 524–25 (1982).

96. Penn. Coal Co. v. Sanderson, 6 A. 453, 459 (Pa. 1886).

97. *Id.*

98. *Id.* at 464; *see also* Bliss v. Anaconda Copper Min. Co., 167 F.3d 342, 369–70 (D. Mont. 1909) ("I cannot overlook the historical fact that Congress, through its beneficent legislation, invited the exploitation of the Rocky Mountains by prospectors for the precious metals, and that, as a result of the value and extent of the mines discovered in this and other mining states, population has increased, labor has been in demand, cities have been built, business has expanded, commerce has thrived, transportation facilities have changed and improved. What was a wilderness less than a half a century ago has, principally through the development of mineral wealth, become a scene of energy and restless activity.").

company, stating that "many springs must be necessarily destroyed in order that the proprietors of valuable minerals may enjoy their own."[99]

The California Supreme Court expressed similar sentiments in the 1928 case *Boone v. Kingsbury*, in which the court commanded the surveyor general to issue the plaintiffs permits to prospect for oil, oil shale, gas, and other resources on public lands despite evidence that such development would be harmful to navigation and fisheries.[100] In ordering that the permit be issued, the court stated that "the commercial value of these subterranean products is enormous," and oil "is so closely allied with state and national welfare as to make its production a matter of state and national concern."[101] The court went on to state that "the development of the mineral resources, of which oil and gas are among the most important, is the settled policy of state and nation, and the courts should not hamper this manifest policy except upon the existence of most practical and substantial grounds."[102]

These cases highlight that, in the late nineteenth and early twentieth centuries, courts in natural resource-dependent states protected mineral development rights as both a matter of public interest as well as state and national economic development. As a result, mineral development frequently outweighed other private and public interests, including other economic interests, that were not based on mineral development rights, such as agriculture, industries relying on sources of clean water, and, of course, environmental protection interests.

Yet not all courts during the late nineteenth and early twentieth centuries balanced mineral development and environmental protection in the same way. Some courts, particularly in non-mining states, were more likely to determine that the public interest and environmental harms outweighed mineral development rights. For instance, in 1930, in *Meriwether Sand & Gravel Company v. State*, the Arkansas Supreme Court affirmed a district court's decision to enjoin a company from discharging gravel into a creek, stating that "[t]he water is no longer limpid and pure, but muddy and turbid, to the extent that fish are unable to live there, and those that reach this stream from below must come to the surface to obtain necessary oxygen, and after a time sink into the water only to die and be cast upon the shore."[103] Likewise, in 1915, in *Packwood v. Mendota Coal & Coke Company*, the Washington Supreme Court ordered a company to pay damages in connection with its coal washing operations that polluted a creek and interfered with downstream

99. Wheatley v. Baugh, 25 Pa. 528, 535 (Pa. 1855).
100. Boone v. Kingsbury, 273 P. 797, 806 (Cal. 1928).
101. *Id.* at 812.
102. *Id.*
103. Meriwether Sand & Gravel Co. v. State, 26 S.W.2d 57, 60 (Ark. 1930).

neighbors' use of the water for domestic and farm purposes.[104] The court rejected the argument that the defendant "was only exercising its rights" and also rejected the defendant's argument that a determination of liability would "hinder the development of the great wealth of coal and iron in the bowels of our mountains, and will be subversive of great public policy, which demands the development of our wealth therein, and tends to the weal of the whole people of the state, and that a few individuals injured thereby must be without redress."[105]

In all of these cases, courts balanced the private interest in mineral development with the public interest and environmental protection. Not surprisingly, mining-dependent states often found private mineral development rights to outweigh any competing economic or environmental interests. States less dependent on mining, by contrast, were more likely to prescribe limits on mineral development rights or require payment of damages for exercise of mining rights.[106] Regardless of these differences, it is clear that in the late nineteenth and early twentieth centuries, many state legislatures and courts protected mineral development rights, even when in conflict with other important interests.

2. *Granting and Protecting Property Rights in Water*

Like the history of mineral development in the United States, the history of water law, particularly in the West, shows how states, first through the courts and then through legislative codification, created and protected interests in the use of water in order to settle the West and spur economic growth. As in the case of mineral development, courts and legislatures in many areas of the country created laws and doctrines that promoted water rights ahead of competing needs that did not as strongly promote economic growth.

In eastern and midwestern states, where water is generally more plentiful, courts adopted a riparian rights regime, which gives each owner of land bordering a river or stream the right to make reasonable use of the water and imposes liability on upper riparian owners who unreasonably interfere with downstream uses.[107] Despite plentiful water in the East, however, Carol Rose has pointed out that riparian water law created an entitlement system that gave a preference to hydropower and

104. Packwood v. Mendota Coal & Coke Co., 146 P. 163, 164–65 (Wash. 1915).

105. *Id.* at 165.

106. *See* Guido Calabresi & Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089 (1972) (providing options for protecting entitlements consisting of a "property rule" that gives the holder the right to engage in the activity in question unless he or she chooses to sell that right to the aggrieved party in a voluntary transaction, or a "liability rule" that gives the holder the right to engage in the activity in question only upon payment of damages to the aggrieved party).

107. *See generally* GOULD ET AL., *supra* note 5, at 7–11.

industrial uses over competing uses in order to spur economic development and manage the resource.[108]

In the West, where water is generally scarce, states generally adopted a "prior appropriation" regime where rights to water arise from a permit granted on a first-in-time basis. Under prior appropriation, the permit-holder may use water for enumerated beneficial purposes (irrigation, mining, manufacturing, etc.) if water is available after satisfying the claims of other users with earlier appropriations.[109] The right to water may be bought and sold (subject to the rights of junior appropriators), its place of use may be changed, and the rights to water use are not limited to riparian lands.[110] By adopting the prior appropriation doctrine, states in the West wanted to convey secured rights to water use for irrigation and industrial development to spur economic growth.[111]

Not surprisingly, in those states where water was critical for resource development, courts early on tended to protect property interests in water for economic use, even when protecting such property interests interfered with the property rights of others or with environmental protection goals. For instance, in 1882, in *Coffin v. The Left Hand Ditch Co.*, the Colorado Supreme Court affirmed that the common law doctrine of prior appropriation governed water rights in the state and held that a prior appropriator of water had superior rights to that of a riparian owner whose land was naturally irrigated by the same water.[112] The court noted that "[t]he climate is dry, and the soil, when moistened only by the usual rainfall, is arid and unproductive" and thus water in the various streams "acquires a value unknown in moister climates."[113] Accordingly, the court found that water not merely incident to the soil but that it "rises, when appropriated, to the dignity of a distinct, usufructuary estate, or right of property."[114]

Likewise, in 1855, in *Irwin v. Phillips*, the California Supreme Court confirmed application of the prior appropriation doctrine in California, holding that a miner who had appropriated water from a stream to use in

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108. *See* Carol Rose, *Energy and Efficiency in the Realignment of Common-Law Water Rights*, 19 J. LEGAL STUDIES 261, 278–85, 294–96 (1990).

109. *See* GOULD ET AL., *supra* note 5 at 7–11.

110. *See id.*

111. *See id.*

112. Coffin v. Left Hand Ditch Co., 6 Colo. 443, 446–47 (Colo. 1882).

113. *Id.* at 446.

114. *Id. But see* David B. Schorr, *Appropriation as Agrarianism: Distributive Justice in the Creation of Property Rights*, 32 ECOLOGY L.Q. 3 (2005) (analyzing the *Coffin* case and contending that the Colorado approach to water rights established in that case was not to create a preference for private property over common property in water but was instead to break the common-law monopoly of riparian owners and open access to water resources to all legitimate users).

his off-site mining operations had superior rights to a later miner who wished to appropriate water for mining purposes on riparian lands.[115] In holding that the first miner has superior rights to the water, the Court stated that it was "bound to take notice of the political and social condition of the country" and that the territory at issue consists of "mineral lands."[116] Moreover, among the "most important" rights are those of miners to be protected in their selected localities, and "the rights of those who, by prior appropriation, have taken the waters from their natural beds, and by costly artificial works have conducted them for miles over mountains and ravines to supply the necessities of gold diggers, and without which the most important interests of the mineral region would remain without development."[117]

The early water rights cases generally follow a similar pattern to the mining cases in that courts were willing to define and uphold rights to use or obtain access to water in order to further the development of natural resources and promote state economic growth, even if that interfered with the interests of others. Indeed, early on many states in the West both codified the prior appropriation doctrine and enshrined the right to appropriate water for beneficial use in their constitutions.[118] In both the mining and water rights cases, courts focused on the public interest, which, at that time, weighed heavily in favor of development of resources rather than the right to clean water for its own sake or for the pursuit of economic gain not squarely based in natural resource development. Indeed, it was not until the environmental movement of the 1970s that courts more commonly embraced environmental protection as a matter of public interest even when environmental protection directly conflicted with natural resource development and entrenched property rights.

C. Pollution Control and Environmental Protection Laws: Limiting Property Rights to Protect the Environment, Public Health, and Welfare

With the rise of the environmental movement in the late 1960s and early 1970s, lawmakers and the public began to acknowledge the need for significant, national action to stop the depletion of natural resources and destruction of the natural environment.[119] This led, over the next decade,

115. Irwin v. Phillips, 5 Cal. 140, 147 (Cal. 1855).

116. *Id.*

117. *Id.*

118. *See* GEORGE A. GOULD ET AL., CASES AND MATERIALS ON WATER LAW 28–33 (7th ed. 2005).

119. *See* LAZARUS, *supra* note 2, at 49–51, 67–76 (discussing historical roots and social changes that led to the exponential growth of environmental statutes and regulations in the 1970s); ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 90–91 (6th ed. 2009) (describing rise of the environmental movement and how federal

to the enactment of the foundational environmental laws we continue to rely on for pollution control and natural resource protection.[120] By placing limits on emissions and imposing liability for pollutant discharges to air, water, and land, these federal laws and the accompanying state laws placed limits, in some cases significant limits, on the ability of private parties to use their land, businesses, or resources in a way that maximized profits and use.[121] The pollution control, land use, and other environmental laws enacted in the 1970s involved many of the same natural resources that the government eagerly conveyed for development a century before. But times and attitudes had changed. That meant new limits on natural resource development and new limits on the right to capitalize on property rights in those resources despite externalities in the form of air pollution, water pollution, and interference with neighboring land uses.

As a result of this shift toward increased environmental protection, parties seeking to retain unfettered natural resource development rights often brought constitutional challenges against these laws, sometimes under the Commerce Clause—challenging Congress's authority to enact the laws in the first place or apply them in particular circumstances[122]—and also under the Fifth Amendment Takings Clause, when a particular application of the law allegedly reduced or eliminated the value of private

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and state politicians began to embrace environmental causes which resulted in the explosion of federal and state environmental legislation in the 1970s).

120. *See, e.g.*, Clean Air Act, 42 U.S.C. §§ 7401–7671q (2006); Clean Water Act, 33 U.S.C. §§ 1251–1387 (2006); National Environmental Policy Act, 42 U.S.C. §§ 4321–4370h (2006); Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. §§ 136–136y (2006); Surface Mining Control and Reclamation Act, 30 U.S.C. §§ 1201–1328 (2006); Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901–6992k (2006); Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601—9675 (2006); Toxic Substances Control Act, 15 U.S.C. §§ 2601–2695d (2006).

121. *See* PERCIVAL ET AL., *supra* note 39, at 90-95 (describing enactment of major federal environmental laws and their impact on government and private activity); *see also* Richard L. Revesz, *Federalism and Environmental Regulation: A Public Choice Analysis*, 115 HARV. L. REV. 553, 578–79 (2001) (discussing state pollution control laws); Alexandra B. Klass, *Common Law and Federalism in the Age of the Regulatory State*, 92 IOWA L. REV. 545, 581–82 (2007) (same).

122. *See, e.g.*, Hodel v. Va. Surface Mining & Reclamation Ass'n, 452 U.S. 264 (1981) (rejecting claim that federal Surface Mining Control and Reclamation Act of 1977 violated the Fifth and Tenth Amendments and was outside of Congress's power to regulate under the Commerce Clause); Gibbs v. Babbitt, 214 F.3d 483 (4th Cir. 2000) (finding the U.S. Fish & Wildlife Service regulations limiting red wolf takings, implemented under the Endangered Species Act, were within Congress's power under the Commerce Clause); United States v. Olin Corp., 107 F.3d 1506 (11th Cir. 1997) (rejecting Commerce Clause challenge to Comprehensive Environmental Response, Compensation, and Liability Act); Nat'l Ass'n of Home Builders v. Babbitt, 130 F.3d 1041 (D.C. Cir. 1997) (rejecting Commerce Clause challenge to Endangered Species Act).

property in the context of resource development rights.[123] Despite such challenges, courts in the late twentieth century were more reluctant to uphold natural resource development rights in light of harms to the public interest and to the environment.[124]

This judicial transition is evident in some of the rhetoric of post-1970 state and federal court decisions relying on the public trust doctrine,[125] other common law doctrines, and approaches to statutory interpretation, which recognized environmental protection and pollution control goals on the same or an even higher level than the protection of property rights in land and natural resources. In many cases, courts focused on new knowledge, new concerns, or the failure of the natural resource development model to serve as a proxy for the public interest. For instance, in *Just v. Marinette County*, the Wisconsin Supreme Court in 1970 rejected landowners' claims that a county's shoreland zoning ordinance prohibiting them from filling wetlands on their property was unconstitutional.[126] Instead, the court held that the ordinance was a valid exercise of the police power based on the public trust doctrine.[127] In reaching its decision, the court declared that the case caused it "to reexamine the concepts of public benefit in contrast to public harm and the scope of an owner's right to use his property."[128] The court discussed the interrelationship between preserving the natural status of wetlands and preventing pollution of navigable waters, and noted that in the past, swamps and wetlands "were once considered wasteland, undesirable, and not picturesque."[129] The court went on to observe that as people "became more sophisticated, an appreciation was acquired that swamps and wetlands serve a vital role in nature, are part of the balance of nature and are essential to the purity of the water in our lakes and streams."[130] Further describing this transformation in view, the court stated that

123. *See Hodel*, 452 U.S. 264, 295–97 (rejecting claim that Surface Mining Control and Reclamation Act amounted to a taking of private property without just compensation).

124. *See infra* notes 126–41.

125. The "public trust doctrine" places an obligation on states to protect and preserve navigable and tidal waters for the use and benefit of the public. The doctrine has ancient roots and, in some states, has been applied broadly to protect not only access to beaches, fishing, and navigation, but also water-dependent environmental resources. For a more detailed discussion of the public trust doctrine, and its role in modern environmental protection efforts, see Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471 (1970); Alexandra B. Klass, *Modern Public Trust Principles: Recognizing Rights and Integrating Standards*, 82 NOTRE DAME L. REV. 699 (2006).

126. Just v. Marinette Ctny., 201 N.W.2d 761 (Wis. 1972).

127. *See id. at* 767–68.

128. *Id.* at 767.

129. *Id.* at 768.

130. *Id.*

swamps and wetlands "are a necessary part of the ecological creation and now, even to the uninitiated, possess their own beauty in nature."[131]

The court then turned to the role of property rights in nature and asked, "Is the ownership of a parcel of land so absolute that man can change its nature to suit any of his purposes?"[132] In answering that question, the court cited the historical despoliation of forests and concluded that "an owner of land has no absolute and unlimited right to change the essential natural characteristics of his land so as to use it for a purpose for which it was unsuited in its natural state and which injures the rights of others."[133] Thus, the court expressed a strong sentiment that environmental protection and pollution control goals could outweigh private property rights in land and water, and it used not only legal doctrine, but the public's new awareness of environmental issues, to justify the result.

Likewise, in *National Audubon Society v. Superior Court*, also known as the *Mono Lake Case*, the California Supreme Court in 1983 relied on the public trust doctrine to direct the state water board to take Mono Lake's ecological interests into account in considering whether to allow diversions from the lake for domestic use.[134] The court rejected the idea that the water board had no choice but to grant the city's request for more water in connection with proposed development, and it held that the water board as well as all agencies and courts in the state must balance property interests in water (even those previously conveyed) with the impact on the scenery, ecology, and human uses of Mono Lake.[135] The court found that such balancing was necessary even if it required reducing water diversions previously granted and that "the state is not confined by past allocation decisions which may be incorrect in light of current knowledge or inconsistent with current needs."[136]

The Arizona Supreme Court reached a similar conclusion in the context of groundwater. In 1981, in *Chino Valley v. Prescott*, the Arizona Supreme Court held that the City of Prescott did not have an unlimited right to the groundwater under its land, and that a state law limiting groundwater withdrawals was not a violation of due process and did not constitute a taking.[137] The court stated that there was no right of ownership of groundwater in the state prior to its capture and withdrawal, and that it was the state's public policy in the interests of stabilizing the economy and protecting the welfare of the state to

131. *Id.*
132. *Id.*
133. *Id.*
134. Nat'l Audubon Soc'y v. Superior Court, 658 P.2d 709, 728–29 (Cal. 1983).
135. *See id.* at 728.
136. *Id.*
137. Chino Valley v. Prescott, 638 P.2d 1324, 1328–30 (Ariz. 1981).

"conserve, protect and allocate the use of groundwater resources of the state" and to provide comprehensive management and regulation of its use.[138] Thus, unlike in past decades, where the economy and the public interest were cited to create property interests in resources to increase their use and development, here the court cited the same interests as a reason to deny property interests in natural resources and to support limitations on development.

Federal courts during this time period also relied on new information about environmental perils to uphold federal restrictions on land and resource development. For instance, the Fifth Circuit, in *Zabel v. Tabb*, held in 1970 that the Secretary of the Army had authority to deny landowners a permit for dredging and filling wetlands based on environmental protection factors.[139] In rejecting the claim that the permit could be denied only if the work would interfere with navigation, the court stated that the Secretary could consider ecological factors, and, if he was persuaded by them, could "deny that which might have been granted routinely five, ten, or fifteen years ago before man's explosive increase made all, including Congress, aware of civilization's potential destruction from breathing its own polluted air and drinking its own infected water and the immeasurable loss from a silent-spring-like disturbance of nature's economy."[140] In upholding the permit denial as well as Congress's ability to regulate in this area under the Commerce Clause, the court focused on the relationship between the destruction of fish and wildlife on interstate commerce and the undisputed fact that dredge and fill projects tend to "destroy the ecological balance and affect commerce substantially."[141]

These cases show a significant shift away from the rhetoric of resource development and economic progress and toward a greater recognition of environmental protection goals and needs. Moreover, the cases often explicitly acknowledge the need to abandon past approaches and embrace regulation and permitting schemes even if they might interfere with natural resource development in a way that would have been unheard of in prior decades.

D. Convergences and Concerns: Applying the Natural Resource Development Model to Wind and Solar

Since the 1970s and the enactment of pollution control limitations on natural resource development, many aspects of the natural resources and pollution control models have converged. In some instances, laws like the

138. *See id.* at 1328–29 (quoting ARIZ. REV. STAT. § 45-401 (1980)).
139. Zabel v. Tabb, 430 F.2d 199, 206 (5th Cir. 1970).
140. *Id.* at 201.
141. *Id.* at 203–04.

Clean Air Act and the Clean Water Act placed comprehensive limits on all activities that caused air or water pollution, including development of natural resources, thus changing fundamentally the way in which mining, forestry, oil and gas development, and other natural resource development activities could proceed. In other cases, laws like the Surface Mining Control and Reclamation Act[142] placed new limits on one particular industry, thus changing significantly the relationship between the government and private parties over development of a specific resource.[143] Scholars have since struggled to some extent with the boundary lines between natural resource and environmental law.[144]

Despite the increasing overlap between the two areas of law, many distinctions remain, particularly in the importance of property rights to each area. As Robert Fischman has argued, modern natural resources law remains distinctive from environmental law for various reasons, two of which are particularly relevant here: the focus of natural resources law on extraction and consumption of primary goods and services, as opposed to the environmental focus on the unwanted side effects of extraction and consumption; and the continued property-law foundation of natural resources law as compared to environmental law as shown in continuing Fifth Amendment protection for unpatented mining rights, the property-rights basis for state water policy, and the property-based regimes for managing fisheries and migratory animals.[145]

Thus, the property rights foundation for early natural resources law, even considering all the modifications brought about by pollution control law, remains highly relevant as we consider how to create a regulatory system to encourage the development of solar, wind, and other forms of renewable energy. An understanding of historical natural resources law is integral to avoid repeating mistakes that led to the misuse and overuse of minerals, water rights, and other resources.

This understanding of historical natural resources law is particularly relevant in evaluating actions that states have taken to foster renewable energy projects. States have already begun to allow for the creation of property interests in solar and wind access in the form of easements, and there are advocates for protecting greater property interests in these

142. 30 U.S.C. §§ 1201–1328 (2006).

143. *See supra* notes 120–21 and accompanying text.

144. *See, e.g.*, Fischman, *supra* note 52, at 717–19 (attempting to examine where to draw the contemporary boundaries between environmental law and natural resources law); LAZARUS, *supra* note 2, at 182–84 (explaining how the two fields have converged in many ways over the past thirty years since the rise of environmental regulation beginning in the 1970s).

145. *See* Fischman, *supra* note 52, at 731–32, 746–47; *see also* LAZARUS, *supra* note 2, at 180–81.

resources, using structures from water law and oil and gas law.[146] As scholars and policymakers search for ways to use property law to encourage the development and use of renewable energy, it is understandable that many would look to the closest analogues, which, in this case, are the policies underlying the development of historical natural resources. In the case of renewable energy, however, it will be important to balance at the outset historical concepts of private interests in natural resources with the preservation and pollution control goals of modern environmental law. To the extent states are attempting to model solar or wind legal frameworks on a prior appropriation model from water rights or a severance model from mining law, it will be important to determine whether the drawbacks of such approaches outweigh the benefits. For example, the prior appropriation system of conveying and allocating rights to water use, which was developed to encourage construction of water diversion projects for agriculture and industrial development, is not well-suited to resolving today's conflicts between traditional water use and the desire to leave water in place for conservation and species protection purposes.[147] Although such a system encouraged development through creating certainty of continued access to the resource and created incentives to develop technology to more efficiently capture the resource, it also created inflexibility, engrained expectations, overuse, and misuse of the resource, which were difficult to overcome when circumstances, technology, and needs changed.[148] While both courts and

146. *See* Rule, *supra* note 75 (assuming for purposes of the article that landowners hold an ownership right in wind or at least a right to capture the wind, and arguing that the Calabresi & Melamed "Rule Four" should be used to resolve conflicts between landowners of competing wind rights, giving the downwind owner an option to pay the upwind owner to prevent the installation of wind turbines); *accord* Calabresi & Melamed, *supra* note 106; Alan Alexander, *supra* note 56 (forthcoming 2010), *available at* http://ssrn.com/abstract=1584346 (arguing that Texas should enact a statute clarifying that wind is a natural resource similar to oil, natural gas, or water and that it should consider allowing severance of those resources from the surface estate); *see also* Bronin, *supra* note 73, at 881, 884–85 (arguing for creation of a solar rights regime based on water law as part of a two-pronged approach that combines property rights with governmental allocations such as zoning or permitting); K.K. DuVivier, *Animal, Vegetable, Mineral—Wind? The Severed Wind Power Rights Conundrum*, 49 WASHBURN L.J. 69 (2009) (discussing problems with recent actions by courts and scholars to classify wind as comparable to mineral rights).

147. *See, e.g.*, A. Dan Tarlock, *The Future of Prior Appropriation in the New West*, 41 NAT. RES. J. 769, 772 (2001) (noting problems with prior appropriation doctrine including that the "perpetual 'use it or lose it rights' lock too much water into marginal agriculture and generally inefficient off-stream consumptive uses to the detriment of aquatic ecosystem values and the needs of growing urban areas").

148. *See* Holly Doremus & Dan Tarlock, *Fish, Farms, and The Clash of Cultures in the Klamath Basin*, 30 ECOLOGY L.Q. 279, 339 (2003) (stating that "the doctrine of prior appropriation has locked too much water into inefficient agricultural uses and does not provide enough water for growing cities and ecosystem restoration"); Ray Huffaker, et al., *The Role of Prior Appropriation in Allocating Water Resources in the 21st Century*, 16 INT'L J. OF WATER RES. DEV. 265, 269 (2000) (stating that "the protection that the prior appropriation doctrine was

legislatures at the state level have attempted to respond to this problem in the water rights context by recognizing instream appropriations as a beneficial use, or by modifying other aspects of the doctrine, the process has not been smooth, has taken decades, and exists only as an overlay on an entrenched property rights-based system that is arguably not well suited to today's conflicting water needs.[149]

The limitations of and adverse environmental impacts associated with the history of the conveyance of mineral development rights and severance of those rights from the surface provides a similar caution.[150] First, the history of mineral rights development at the expense of environmental protection illustrates the drawbacks associated with favoring natural resource development over other interests and values.[151] Beyond that, though, there are potentially additional problems with borrowing concepts of severance from mining law to wind, or in the future solar, because wind and solar development require a much more extensive use of the surface than most mineral development.[152] It is important to note these concerns when considering not only what states

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able to provide historically, when irrigation technology was relatively static, is disappearing as a result of inevitable modern-day technological improvements"); Janet Neuman, *Beneficial Use, Waste, and Forfeiture: The Inefficient Search for Efficiency in Western Water Use*, 28 ENVTL. L. 919, 975 (1998) (stating that while the concept of beneficial use in prior appropriation doctrine "has been instrumental in supporting and encouraging economic development and settlement of the arid West" it now results in overappropriated streams in the West without maximizing the number of water users).

149. *See* A. Dan Tarlock, *Appropriation for Instream Flow Maintenance: A Progress Report on "New" Public Western Water Law*, 1978 UTAH L. REV. 211, 211, 247 (1978) (stating in 1978 that in 1975, dedicating water to instream uses such as fish and wildlife was still a minor factor in western water law, that instream flow rights were receiving more recognition by 1978, but that it was now up to western water lawyers "to devise the legislative, administrative, and judicial standards for the recognition of these uses, and to establish on a state-by-state basis the allocation of institutional responsibility for preservation flow establishment"); Christine A. Klein, *The Constitutional Mythology of Western Water Law*, 14 VA. ENVTL. L.J. 343, 344 (1995) (stating in 1995 that the "myth" that western water law requires a "diversion" for protection which prohibits allocations for instream flow "endures and exerts a subtle influence on western water law, creating both confused judicial interpretation or inconsistent precedent and legislative misunderstanding of the status of diversion"). For a series of cases over decades in which state courts grappled with whether administrative and legislative efforts to recognize instream flow rights were consistent with state constitutions or common law prior appropriation doctrine, see *In re* Adjudication of Existing Rights to Use All the Water, 2002 MT 216, 311 Mont. 327, 55 P.3d 396, 406 (finding instream flow rights for nondiversionary fish, wildlife, and recreational uses were valid); *In re* Application A-16642, 463 N.W.2d 591, 603 (Neb. 1990) (finding statutory scheme authorizing instream appropriation was constitutional); Dep't of Parks v. Idaho Dep't of Water Admin., 530 P.2d 924, 927 (Idaho 1974) (holding Department of Parks could constitutionally appropriate water for recreation and scenic uses); E.C. Fullerton v. State Water Res. Bd., 153 Cal. Rptr. 518, 528 (Cal. Ct. App. 1979) (holding state department of fish and game could not provide for instream flow to preserve fish resources without statutory authorization); *see also* GOULD ET AL., *supra* note 5, at 24–34 (discussing cases, constitutions, and statutes).

150. *See supra* notes 103–06.

151. *See supra* Part II.B.1.

152. *See* DuVivier, *supra* note 146, at 85.

have already done in the context of promoting solar and wind development, but what they may do in the future.

III. PROPERTY RIGHTS ON THE NEW FRONTIER

This Part considers property rights in regards to solar and wind interests—the new frontier of natural resource development—and concludes that, while state and local governments have in part relied on a historical natural resource development model, they should also consider pollution control approaches, such as zoning and permitting, in fashioning solar and wind interests. This Part then presents a suggested development structure for both solar and wind projects, respectively, taking into account the limits of the natural resource development model as well as the particular geographic constraints of solar and wind development.

A. Property Rights in Solar and Wind Access and Related State Permitting Frameworks

This subpart explores the extent to which state and local governments have created, defined, and protected property rights in access to solar and wind as well as the extent to which they have removed local impediments to solar and wind development and created permitting, siting, and land use frameworks for such development. Regulatory activity in regards to solar and wind projects on private land has thus far occurred almost exclusively at the state and local levels, with the federal government limiting its involvement to financial assistance and permitting of solar and wind development on federal public lands.[153] Many states have created similar property structures and regulatory frameworks for solar and wind. There is also significant diversity among the states, however, revealing that productive state experimentation is taking place, and that these initiatives can serve not only as potential models for other states but, ultimately, for the federal government.

1. Solar

Although the amount of solar energy generated in the United States currently represents less than one percent of annual U.S. electricity sales,[154] many state and local governments are attempting to facilitate the development of solar energy. Thus far, both the federal government and

153. *See supra* Part I.B (discussing federal financial incentives and grants for solar and wind on private land).

154. See *Renewable Energy Consumption and Electricity Preliminary Statistics 2009*, U.S. ENERGY INFO. ADMIN., http://www.eia.doe.gov/cneaf/alternate/page/renew_energy_consump/rea_prereport.html (last visited Jan. 11, 2011) (indicating that solar energy made up a 1 percent market share for total consumer energy in 2009).

state governments have created incentive programs, grants, and loans to promote its use.[155] Many state and local governments, however, drawing on historical natural resources law, have also created property rights in solar access.

Solar energy is harnessed commercially primarily through the use of two main technologies: concentrating solar power (CSP) and photovoltaic (PV).[156] As of 2009, the total CSP and PV electric power capacity installed in the United States was just over 2000 megawatts (MW).[157] CSP converts solar power into thermal energy by using mirrors or lenses to concentrate radiation onto a receiver.[158] Because the most cost-efficient CSP plants are large, they are typically associated with energy suppliers to utilities or with utilities themselves.[159] By contrast, a PV system, the most common method of using solar power, converts sunlight into energy when solar radiation hits a semiconductor, releasing electrons.[160] PV systems, which allow for solar energy production on a smaller level, are generally made up of ground mounted or roof mounted panels containing several individual solar cells or a single thin layer.[161] Because PV solar systems are most closely associated with commercial and residential development on private lands (as opposed to the CSP plants more often located on public lands), the remainder of this section focuses primarily on the use of PV technology in the residential and commercial setting.

Some argue that a major barrier to the widespread use of PV systems in the United States is the failure of states to recognize "solar rights" or otherwise engage in land use planning in a manner that provides some assurance to installers of PV and other systems that neighboring property owners will not engage in development that will block access to the sun.[162] At one time, American courts recognized the English doctrine of "ancient lights," which granted a property owner the right to prevent a

155. *See supra* Part I.B; Bronin, *supra* note 73, at 883–84 (discussing state and federal incentive programs for solar energy).

156. *See Solar Technology and Products*, SOLAR ENERGY INDUS. ASS'N, http://www.seia.org/cs/solar_technology_and_products (last visited Jan. 11, 2011).

157. *See* SOLAR ENERGY ASS'N, U.S. SOLAR INDUSTRY YEAR IN REVIEW 2009, at 11 (2010), *available at* http://www.seia.org/cs/about_solar_energy; Craig M. Kline, *Solar*, *in* THE LAW OF CLEAN ENERGY (Michael Gerrard ed., forthcoming 2011).

158. *See* SOLAR ENERGY INDUS. ASS'N, CONCENTRATING SOLAR POWER: UTILITY-SCALE SOLUTIONS FOR POLLUTION-FREE ELECTRICITY 1 (2009), *available at* http://seia.org/galleries/pdf/factsheet_csp.pdf.

159. *See Solar Technology and Products*, SOLAR ENERGY INDUS. ASS'N, http://www.seia.org/cs/solar_technology_and_products (last visited Jan. 11, 2011).

160. SOLAR ENERGY INDUS. ASS'N, PHOTOVOLTAIC SOLAR TECHNOLOGY: CREATING ELECTRICITY FROM SUNLIGHT (2010), *available at* http://www.seia.org/galleries/pdf/SEIA_PV_Factsheet.pdf.

161. *See Small Solar Electric System Arrays*, U.S. DEP'T OF ENERGY (Oct. 20, 2010), http://www.energysavers.gov/your_home/electricity/index.cfm/mytopic=10800.

162. *See* Bronin, *supra* note 56, at 1219–21.

neighbor from blocking light that reached the interior of a building and that had been enjoyed continuously for twenty years. This cause of action was eliminated in all U.S. jurisdictions by the late nineteenth century.[163] As a result of the energy crisis of the 1970s, however, states began to focus on solar power and enacted some of the first laws to encourage solar energy. With the renewed focus on solar power today, some states are revising their statutes from this earlier period while others are enacting solar legislation for the first time.

State legislation to regulate and encourage solar development has taken many forms. For instance, some states have enacted laws that void any property conveyances, agreements, or deed transfers between parties that specifically prohibit the use of solar collectors.[164] Other state laws invalidate covenants in common interest communities or local zoning ordinances that prohibit solar collectors, although those same laws allow for reasonable regulation of such collectors. Another form of state regulation is aimed at encouraging local governments to implement zoning or permitting ordinances to protect solar rights.[165]

Some states have focused specifically on recognizing property rights in solar access. Many states now officially recognize "solar easements" as a type of property agreement that can be voluntarily entered into by two parties and will run with the land to subsequent property owners.[166] In states that recognize such easements, the easement agreement serves to protect the landowner from a neighbor who may interfere with solar access once the system is installed. These easement statutes often outline the specific information that must be included in the creation of such an easement, and some go so far as to provide a sample easement agreement.[167] The availability of solar easements may be limited, however, because they are voluntary in nature and servient owners may overcharge because of bilateral monopoly problems.[168] To address this issue, Iowa has enacted a statute that allows local regulatory boards to create easements without the servient owner's consent; the statute requires that the servient landowners receive payment of just compensation based on the difference in the fair market value of the servient property before and after granting the solar access easement.[169]

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163. *See id.* at 1259–60 (discussing "ancient lights" doctrine).

164. *See infra* notes 200–01 and accompanying table.

165. *See id.*

166. *See id.*

167. *See, e.g.*, N.H. REV. STAT. ANN. § 477:51 (2010).

168. *See* Bronin, *supra* note 56, at 1229. In a bilateral monopoly, transaction costs are generally higher than normal because it is difficult for either party to bargain with anyone else over the entitlement. *See* Herbert Hovenkamp, *Rationality in Law & Economics*, 60 GEO. WASH. L. REV. 293, 298 (1992).

169. *See id.* at 1230 (citing IOWA CODE ANN. §§ 564A.7.1–.7.9 (2009)).

Other states and local governments have created permit systems and zoning ordinances to address solar access. New Mexico and Wyoming use a prior appropriation approach modeled after water law where the owner of a solar collector obtains rights to solar access if the owner used the collector before other uses that may block sunlight and if the use is considered to be beneficial.[170] Specifically, the New Mexico Solar Rights Act recognizes the claim to a solar right for individual property owners.[171] Property owners may claim a solar right after placing a solar collection system that meets specific statutory requirements on the property.[172] Once claimed, the statute makes the right enforceable "against any person who constructs or plans to construct any structure in violation of the Solar Rights Act or the Solar Recordation Act."[173] Recording the claim with the county clerk creates an appurtenant easement protecting the solar access of that individual property owner and subsequent owners.[174] When such a filing occurs, notice is given to surrounding landowners that may be burdened by the easement, and then a process of review occurs if there are any objections.[175] Finally, the statute leaves local governments free to increase regulation of solar rights and provide more detailed zoning or planning schemes.[176]

Wisconsin uses the reasonable use rule from private nuisance law by allowing municipal agencies to grant a permit to a solar user if doing so would not unreasonably interfere with development plans, and if the benefits of the solar system to the applicant and the public outweigh the burdens.[177] The Wisconsin law also creates a private cause of action for nuisance that owners of solar collection systems can bring against neighbors who may interfere with such systems.[178] Under the statute, a party can file a statutory nuisance action for damages against a neighboring property owner for actions that interfere with the use of a solar system once that system has been installed.[179] The statute also prevents local governments from amending zoning ordinances in a

170. *See* Bronin, *supra* note 56, at 1238–39; *see also* Rule, *supra* note 76, at 876–78 (discussing New Mexico and Wyoming solar statutes and contending that even though the statutes purport to be first-in-time rules based on prior appropriation doctrine from water law, the statutes do not properly apply the doctrine because they assume that neither solar users nor neighbors already possess rights in the airspace when in fact they do possess such rights under common law).

171. N.M. STAT. ANN. § 47-3-4 (2010).

172. N.M. STAT. ANN. § 47-3-8 (2010).

173. *Id.*

174. *See id.*

175. *See* N.M. STAT. ANN. § 47-3-9 (2010).

176. *See* N.M. STAT. § 47-3-11 (2010).

177. *See* Bronin, *supra* note 56, at 1239 (citing WIS. STAT. § 66.0403(5) (2010)).

178. *See* WIS. STAT. § 844.22 (2010).

179. *See* WIS. STAT. § 700.41 (2010).

manner that may hinder solar collection systems.[180] The Wisconsin nuisance statute was intended to codify the Wisconsin Supreme Court's 1982 decision in *Prah v. Maretti*, where the court held that unreasonable obstruction of access to sunlight could constitute a private nuisance.[181]

Although it does not have a permit system, California has one of the most extensive statutory frameworks relating to solar energy rights, and it includes multiple elements of the different statutory schemes found nationwide. California provides protection for residents on the installation end of the process and protects their rights to continued solar access from neighboring properties. The statutory scheme includes the Solar Rights Act[182] and the Solar Shade Control Act.[183] The Solar Rights Act prohibits property conveyances and common interest community regulations that unreasonably limit the installation of solar systems, allows for the creation of solar easements, and limits the ability of local governments to restrict solar access.[184] The Solar Rights Act also requires certain subdivisions to provide for future passive easements and authorizes local governments to enact regulations requiring solar easements in certain subdivisions.[185]

The Solar Shade Control Act seeks to promote the use of vegetation for temperature control while limiting the effect of that vegetation on solar collection energy systems.[186] While the Solar Shade Control Act prevents vegetation interference, it does not operate as a substitute for the solar easement. Specifically, the law does not put restrictions on a neighbor's ability to build a structure that interferes with a solar collector, but merely prevents interference from vegetation.[187] The Solar Shade Control Act is intended to protect smaller solar users and is not intended to protect systems that offset more than a building's electricity demands.[188] Further, in order to be protected, a system must comply with all relevant building regulations. The law directs a property owner planning to install a system to notify a neighbor of the installation to prevent vegetation conflicts, but it does not apply to vegetation planted prior to the installation, vegetation planted to replace plants already

180. *See* WIS. STAT. § 66.0401 (2010).
181. Prah v. Maretti, 321 N.W.2d 182, 184 (Wis. 1982).
182. CAL. CIV. CODE § 714 (West 2010).
183. CAL. PUB. RES. CODE §§ 25980–25986 (West 2010).
184. *See* CAL. CIV. CODE § 714.
185. *See id.*
186. *See* CAL. PUB. RES. CODE § 25980.
187. *See* Zipperer v. Santa Clara, 133 Cal. App. 4th 1013 (2005) (refusing to recognize the creation of an implied solar easement and requiring creation of written documentation to create an express solar easement).
188. *See* CAL. PUB. RES. CODE § 25981 (stating that "for the purposes of this chapter, 'solar collector' does not include a solar collector that is designated and intended to offset more that the building's electricity demands").

growing prior to the installation, vegetation subject to city or county ordinances, or timberland.[189] Moreover, a municipality may exempt itself from enforcement under this statute.[190]

At the local level, Boulder, Colorado has the most elaborate solar zoning ordinances through which it has created a system of "solar envelopes" and "solar fences" for different neighborhoods that creates space where no construction or vegetation can occur that interferes with the solar rights of neighbors.[191] In this way, Boulder has integrated solar access issues into land use planning and zoning to provide expectations and certainty regarding solar access. Ashland, Oregon provides another example of a city that has implemented solar access laws at the local level. Its solar access ordinance includes formulas for lot classification that correspond to solar setback requirements,[192] and provides protection from shade created by vegetation in the form of solar access permits.[193] These solar access permits place limits on neighbors by requiring vegetation not to exceed a certain height.[194] Additionally, Ashland has established a hearing process to resolve disputes when informal discussions fail, and the City also requires the Staff Advisor to file the solar access permit with the County Clerk so that it is registered.[195] Similar to the Boulder ordinance, Ashland is attempting to provide its residents with some certainty regarding solar energy rights, with the stated purpose of the ordinance being "to provide protection of a reasonable amount of sunlight from shade from structures and vegetation whenever feasible to all parcels in the City to preserve the economic value of solar radiation falling on structures, investments in solar energy systems, and the options for future uses of solar energy."[196]

Table 1 provides a summary of the types of statutes which create or convey property interests in solar access or that create permitting systems to obtain such access.

189. *See* CAL. PUB. RES. CODE § 25984.

190. *See* CAL. PUB. RES. CODE § 25985; *see also Zipperer*, 133 Cal. App. 4th 1013 (recognizing the right of local governments to retroactively exempt themselves from provisions of Solar Shade Act).

191. *See* Bronin, *supra* note 56, at 1247.

192. *See* ASHLAND, OR., MUN. CODE § 18.70.030–.040 (2010), *available at* http://www.ashland.or.us/CodePrint.asp?Branch=True&CodeID=3338. A solar setback is "the minimum distance that a structure, or any part thereof, can be located from a property boundary." ASHLAND, OR., MUN. CODE § 18.70.020J.

193. ASHLAND, OR., MUN. CODE § 18.70.070.

194. *See id.*

195. *See* ASHLAND, OR., MUN. CODE §§ 18.70.070, 18.70.80, 18.70.100.

196. *Id.*

TABLE 1. STATE STATUTES ON SOLAR RIGHTS AND PERMITS SYSTEMS

Type of Statute	States
Allows for Solar Easements	Alaska, California, Georgia, Kansas, Kentucky, Missouri, Montana, New Hampshire, North Dakota, Ohio, and Tennessee have enacted such legislation.[197] Colorado, Florida, Indiana, Iowa, Maine, Maryland, Massachusetts, Minnesota, Nebraska, Nevada, New Jersey, New Mexico, New York, Oregon, Rhode Island, Utah, Virginia, Washington, and Wisconsin include solar easements in a broader statutory scheme.[198] Idaho's legislation allows local governments to recognize such easements.[199]
Invalidates Property Conveyance Limitations on Solar Energy Systems	Arizona, California, Colorado, Delaware, Florida, Hawaii, Illinois, Massachusetts, Nevada, North Carolina, Vermont, and Wisconsin have statutes rendering void property conveyances entered into after the effective date of the statute that prohibit use of solar collection systems.[200] Maryland's statute applies retroactively.[201]

197. *See* ALASKA STAT. § 34.15.145 (2010); CAL. CIV. CODE § 801.5 (West 2010); GA. CODE ANN. §§ 44-9-21 to -23 (2010); KAN. STAT. ANN. §§ 58-3801 to -3802 (2010); KY. REV. STAT. ANN. § 381.200 (West 2010); MO. REV. STAT. § 442.012 (2010); MONT. CODE ANN. §§ 70-17-301 to -302 (2010); N.H. REV. STAT. ANN. §§ 477:49–51 (2010); N.D. CENT. CODE §§ 47-05-01 to -13 (2010); OHIO REV. CODE ANN. § 5301.63 (West 2010); TENN. CODE ANN. §§ 66-9-204 to -206 (2010).

198. *See* COLO. REV. STAT. §§ 38-32.5-100.3 to -103 (2010); FLA. STAT. § 704.07 (2010); IND. CODE §§ 32-23-4-1 to -5 (2010); IOWA CODE § 564A (2010); ME. REV. STAT. ANN. tit. 33, §§ 1401–02 (2010); MD. CODE ANN., REAL PROP. § 2-119 (West 2010); MASS. GEN. LAWS ch. 187, § 1A (2010); MINN. STAT. § 500.30 (2010); NEB. REV. STAT. §§ 66-911.01 to -912 (2010); NEV. REV. STAT. §§ 111.370–.380 (2010); N.J. STAT. ANN. §§ 46:3-24 to -26 (West 2010); N.M. STAT. § 47-3-1 (2010); N.Y. REAL PROP. LAW § 335-b (McKinney 2010); OR. REV. STAT. §§ 105.850–.870 (2010); R.I. GEN. LAWS § 34-40 (2010); UTAH CODE ANN. §§ 57-13-1 to -2 (West 2010); VA. CODE ANN. §§ 55-352 to -354 (2010); WASH REV. CODE § 64.04.140 (2010); WIS. STAT. § 700.35 (2010).

199. *See* IDAHO CODE ANN. § 55-615 (2010).

200. *See* ARIZ. REV. STAT. ANN. § 33-439 (2010); CAL. CIV. CODE §§ 714–714.5 (West 2010); COLO. REV. STAT. § 38-30-186 (2010); DEL. CODE ANN. tit. 25, § 318 (2010); FLA. STAT. § 163.04 (2010); HAW. REV. STAT. § 197-7 (2010); ILL. PUB. ACT 096-1436 (effective Jan. 1, 2011); MASS. GEN. LAWS ch. 184, § 23C (2010); NEV. REV. STAT. § 111.239 (2010); N.C. GEN. STAT. § 22B-20 (2010); VT. STAT. ANN. tit. 27, § 544 (2010); WIS. STAT. § 236.292 (2010).

201. *See* MD. CODE ANN., REAL PROP. § 2-119 (West 2010). The law had contained a phrase granfathering in restrictive covenants enacted before the law's passage, but the phrase was removed in 2008. 2008 Md. Laws 138.

Type of Statute	States
Invalidates Common Interest Community (Homeowner Association) Restrictions on Solar Energy Systems	Arizona, California, Hawaii, Illinois, Maryland, New Jersey, North Carolina, Virginia, and Washington limit common interest community regulation of solar collectors.[202]
Prohibits Local Restrictions on Solar Energy Systems or Encourages Local Solar Ordinance Enactment	California, Indiana, Maine, Nevada, New Mexico, and North Carolina prohibit the local ordinances that ban the installation of solar systems.[203] California, Massachusetts, Minnesota, Nebraska, New York, Oregon, and Utah have statutes specifically allowing or encouraging the enactment of local ordinances and/or zoning policies supporting solar energy.[204] Rhode Island requires local governments to enact zoning ordinances that consider solar installation.[205]
Solar Permitting Statutes	California, Iowa, New Mexico, Wisconsin, and Wyoming have statutes that allow various forms of solar access permits by state or local governments.[206]

2. Wind

Unlike the situation with solar energy, where numerous states have statutes recognizing solar easements, only a few states have recognized wind easements or otherwise attempted to address property rights in

202. *See* ARIZ. REV. STAT. § 33-1816 (West 2010); CAL. CIV. CODE §§ 714-714.5 (West 210); HAW. REV. STAT. § 197-7 (2010); ILL. PUB. ACT 096-1436 (effective Jan. 1, 2011); MD. CODE ANN., REAL PROP. § 2-119 (West 2010); N.J. STAT. ANN. § 45:22A-48.2 (West 2010); N.C. GEN. STAT. § 22B-20 (2010); VA. CODE ANN. § 67-700-01 (2010); WASH REV. CODE § 64.38.055 (2010).

203. *See* CAL. GOV'T CODE § 65850.5 (West 2010); IND. CODE § 36-7-2-8 (2010); ME. REV. STAT. ANN. tit. 33, §§ 1421–1424 (2010); NEV. REV. STAT. § 278.0208 (2010); N.M STAT. § 47-3-1 (2010); N.C. GEN. STAT. §§ 153A-144, 160A-201 (2010).

204. CAL. GOV'T CODE § 65850.5 (West 2010); MASS. GEN. LAWS ch. 40A, §§ 1A, 9B; MASS. GEN. LAWS ch. 41, § 81Q (2010); MINN. STAT. § 462.357 (2010); NEB. REV. STAT. §§ 66-913 to -914 (2010); N.Y. GEN. CITY LAW § 20(24) (McKinney 2010); N.Y. TOWN LAW § 263 (McKinney 2010); N.Y. VILLAGE LAW § 7-704 (McKinney 2010); OR. REV. STAT. §§ 227.190–.195, 215.044–.047 (2010); UTAH CODE ANN. § 10-9a-610 (West 2010).

205. R.I. GEN. LAWS § 45-24-33 (2010).

206. CAL. PUB. RES. CODE §§ 29580–25986 (West 2010); IOWA CODE §§ 564A.1–.9 (2010); N.M STAT. §§ 47-3-1 to -12 (2010); WIS. STAT. § 66.0403 (2010); WYO. STAT. ANN. §§ 34-22-101 to -106 (2010).

wind specifically. Instead, most states are still at the stage of creating a range of incentives for wind development along the lines discussed in Part I.B. The creation of property rights in wind is becoming increasingly important as quality wind resources and the land on which to install turbines becomes scarcer.[207] Wind turbines placed too close together can have significant negative impacts on energy production.[208] Indeed, some state setback requirements are insufficient to avoid wind access conflicts between neighboring turbines under separate ownership.[209] Thus, this section discusses in more detail how states with significant wind capacity have used a variety of incentives, sometimes coupled with explicit provisions relating to property rights in wind access, to increase wind energy capacity and avoid conflicts between wind energy systems and between wind energy systems and neighbors.

The wind harnessed to make power from a turbine is formed by a combination of factors—including the uneven heating of the earth's atmosphere, the shape of the earth's surface, and the earth's rotation—which combine to form varying wind patterns across the earth.[210] This wind pushes the blades of a turbine, which in turn spins a shaft connected to a generator.[211] The generator then sends the energy down the shaft and into the energy system.[212]

Once harnessed, wind energy can be used on a variety of scales for a variety of purposes. The American Wind Energy Association (AWEA) estimates that a 5 kW wind turbine can meet all the electricity needs of a standard U.S. home, although much of the savings depend on factors including a home's typical energy usage and the average wind speed where the turbine is installed.[213] Small wind turbines are used not only in the residential setting but also by businesses and local governments to power individual buildings.[214]

With larger, utility-scale wind installations, commonly referred to as wind farms, there are different considerations regarding the type and location of an installation. Manufacturers currently offer utility scale

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207. *See* Rule, *supra* note 74, at 209.

208. *See id.* at 208–11 (discussing problems that can arise when turbines are too close together and providing examples of such problems).

209. *See id.* at 209.

210. *See Wind and Water Power Program: How Wind Turbines Work*, U.S. DEP'T OF ENERGY, http://www1.eere.energy.gov/windandhydro/wind_how.html (last visited Jan. 11, 2011).

211. *See id.*

212. *See id.*

213. *FAQ for Small Wind Systems*, AM. WIND ENERGY ASS'N, http://www.awea.org/documents/factsheets/Small_Wind_FAQ_Factsheet.pdf (last visited Jan. 21, 2011).

214. For instance, the Spirit Lake School District in Iowa installed a 250 kW turbine in 1993, and a 250 kW turbine in 2001, which combine to an average production value of approximately $120,000. IOWA ENERGY CTR., ALTERNATIVE ENERGY REVOLVING LOAN PROGRAM: SPIRIT LAKE SCHOOLS, http://www.energy.iastate.edu/AERLP/downloads/SpiritLake_07.pdf (last visited Feb. 1, 2011).

turbines ranging from 1 to 3 MW.[215] In terms of sizing facilities, a wind farm with twenty turbines producing 2 MW each is a 40 MW wind farm. AWEA estimates that 2 MW of energy produced from the wind provides enough energy to power approximately 600 homes.[216] Accordingly, based on AWEA estimates, the previously noted 40 MW wind farm would generate sufficient energy to power approximately 12,000 households. Using Iowa as an example, as of October 2010, the state had 3670 MW of installed wind capacity,[217] or approximately enough wind energy to power approximately 1.1 million households statewide.

As of November 2010, wind represented 2.4 percent of the U.S. electric energy supply, lagging significantly behind countries like Denmark (20 percent), Portugal (14 percent), and Spain (13 percent).[218] In states that have placed a significant premium on developing wind energy, the percentage of state electric energy supply derived from wind energy is much higher. For instance, Iowa obtains 18.8 percent of its electricity from wind resources, South Dakota 13.6 percent, North Dakota 11.5 percent, and Minnesota 10 percent.[219] By contrast, although Texas has the greatest installed wind capacity in the country as measured in megawatts produced, wind generation accounts for only 6.3 percent of the energy produced in the state because of its greater population, placing it ninth in the nation in terms of the percentage of wind energy capacity used for state electricity needs.[220] A 2010 study by the National Renewable Energy Laboratory found that overland wind energy resources in the contiguous forty-eight states could generate thirty-seven billion megawatt-hours (MWh) of electrical power per year, equal to roughly ten times the current electrical power usage in the continental United States.[221] An earlier study in 2007 found that offshore wind

215. *See* AM. WIND ENERGY ASS'N, AWEA WIND POWER VALUE CHAIN 3, *available at* http://www.awea.org/documents/factsheets/value_chain.pdf (lat visited Jan. 27, 2011); AM. WIND ENERGY ASS'N, WINDS OF CHANGE 20 (2010), http://www.awea.org/documents/reports/BGA_Report_062510_FINAL.pdf (stating in a table that utility scale wind turbines installed in 2009 ranged from 1MW to 3MW).

216. AM. WIND ENERGY ASS'N, WINDPOWER OUTLOOK 2010, at 3 (2010), *available at* http://www.awea.org/documents/reports/Outlook_2010.pdf ("2MW serves the equivalent of 600 homes . . . .").

217. AM. WIND ENERGY ASS'N, THIRD QUARTER 2010 MARKET REPORT 4 (2010), *available at* http://www.awea.org/documents/reports/2010_third_quarter_report.pdf.

218. *See* Larry Flowers, *Wind Powering America Update*, U.S. DEP'T OF ENERGY (June 10, 2010), http://www.windpoweringamerica.gov/filter_detail.asp?itemid=746; *see also* Elizabeth Rosenthal, *Portugal Gives Itself a Clean-Energy Makeover*, N.Y. TIMES, Aug. 10, 2010, at A1 (discussing significant increase in use of renewable energy in Portugal in the past five years based in large part on increase in wind power, and showing renewable energy percentages in various countries).

219. *See* Flowers, *supra* note 218.

220. *See id.*

221. *See* NAT'L RENEWABLE ENERGY LAB., ESTIMATES OF WINDY LAND AREA AND WIND ENERGY POTENTIAL BY STATE FOR AREAS >=30% CAPACITY FACTOR AT 80M (2010),

resources were also significant.[222] As of September 2010, the top six states for installed wind power capacity were Texas (9727 MW), Iowa (3670 MW), California (2739 MW), Oregon (2095 MW), Washington (1964 MW), and Illinois (1848 MW).[223]

Texas is the leader in wind production by a large margin. It has substantial natural wind resources and has a statewide program whereby the Texas Public Utilities Commission designates areas of the state with the best renewable energy resources as "competitive renewable energy zones" and then focuses on constructing transmission necessary to deliver the electricity generated in those zones to customers.[224] Texas was also one of the first states to enact an RPS, in 1999, which required utilities to generate 2000 MW of new renewable energy by 2009.[225] Texas increased its RPS in 2005 to 5800 MW by 2015 and has already exceeded that goal.[226] Texas also has an REC program that gives utilities the flexibility to meet RPS requirements either by generating their own renewable energy or purchasing qualifying RECs.[227] Furthermore, Texas provides tax abatements for equipment used in renewable energy projects. Texas does not have a statewide siting or permitting program, leaving siting issues to local governments.[228] By contrast, although Iowa (ranked second in the nation for installed wind capacity) does not have an RPS, Iowa law provides wind developers with a production tax credit based on kilowatt hours sold during the first ten years of production for facilities that the Iowa Utilities Board determines are eligible (based on such factors as size and in-service date).[229] Iowa wind generators are also able to sell RECs to utilities in other states.[230] Like Texas, Iowa leaves siting and approval issues to local governments.[231]

For its part, Minnesota (ranked seventh for installed wind capacity), has an aggressive RPS—25 percent renewable energy by 2020 for utilities

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available at http://www.windpoweringamerica.gov/pdfs/wind_maps/wind_potential_80M_30percent.pdf.

222. *See* Willett Kempton et al., *Large CO2 Reductions via Offshore Wind Power Matched to Inherent Storage in Energy End-Uses*, 34 GEOPHYSICAL RESEARCH LETTERS L02847 (2007), *available at* http://www.windri.org/conference/Session_1_Vision_Future_of_Wind_Power/Kempton_Article_Mab_Resource_2007.pdf.

223. AM. WIND ENERGY ASS'N, THIRD QUARTER 2010 MARKET REPORT 4 (2010), *available at* http://www.awea.org/documents/reports/2010_third_quarter_report.pdf.

224. *See* Brent Stahl et al., *Wind Energy Laws and Incentives: A Survey of Selected State Rules*, 49 WASHBURN L.J. 99, 136 (2009).

225. *See id.* (citing TEX. UTIL. CODE ANN. § 39.904(a))

226. *See id.* (citing S.B. 20, 79th Leg., 1st Called Sess. (Tex. 2005)).

227. *See id.*

228. *See* Patricia Salkin, *Renewable Energy and Law Use Regulation (Part 2)*, A.L.I.-A.B.A. BUS. L. COURSE MATERIALS J., Apr. 2010, at 27–28.

229. *See* Stahl, *supra* note 224, at 108 (citing IOWA CODE § 476B.2)

230. *See* Stahl, *supra* note 224, at 108.

231. *See* Salkin, *supra* note 228, at 27–28.

with nuclear generating facilities and 25 percent renewable energy by 2025 for other utilities[232]—and provides property tax incentives for wind developers.[233] Minnesota also preempts local regulations and zoning ordinances for wind projects over a certain size, replacing it with a permit system at the state level administered by the Minnesota Public Utilities Commission.[234] Oregon is ranked sixth overall in terms of wind capacity even though its wind resources are modest.[235] The state has a strong RPS and gives facility operators a tax credit of up to $10 million amortized over a period of up to eight years.[236] The Oregon Public Utilities Commission has statewide siting requirements and the Oregon Department of Fish and Wildlife has established environmental guidelines in certain parts of the state.[237] Local governments are responsible for the rest, but the state encourages local governments to create zoning limitations to protect the installation and use of solar and wind energy systems in their jurisdictions.[238] Washington has a state law, the Washington State Energy Facilities Site Locations Act, which governs the state siting and operating conditions of energy facilities.[239] Under the law, although a wind facility works with the county government on siting issues as an initial matter, the state agency (with the governor's approval) can override a permit denial by the county, and the Washington Supreme Court has upheld that preemptive authority.[240]

In addition to these state requirements and programs on siting, permitting, incentives, and RPSs, some states have focused on creating, confirming, or defining property rights in access to wind resources. Unlike solar rights, which have been subject to legislation in some states for decades and which have become even more widespread in recent years, wind property rights are much less common on a nationwide basis. This is likely due to the fact that wind energy use is not as readily available to an individual user, typically due to the significant size and cost of the system.[241] Additionally, wind energy production is much more

232. MINN. STAT. § 216B.1691 (2010). Minnesota also requires that nuclear facilities obtain at least 25 percent of their RPS requirement from wind energy facilities. *See id.*

233. *See* Stahl, *supra* note 224, at 114–15 (providing a brief overview of Minnesota incentives).

234. *See id.* at 115–16 (citing MINN. STAT. §§ 216F.01.2, 216F.07 (2010)).

235. *See id.* at 129.

236. *See id.* (citing OR. REV. STAT. § 469.200(1)(c) (2010)).

237. *See id.* at 131.

238. *See id.* at 129–31.

239. WASH. REV. CODE §§ 80.50.010–.50.904 (West 2011).

240. *See* Residents Opposed to Kittias Turbines v. State Energy Facility Site Evaluation Council, 197 P.3d 1153 (Wash. 2008) (interpreting the Washington State Energy Facilities Site Location Act, WASH REV. CODE §§ 80.50.010–.50.904 (West 2011)).

241. Residential wind turbines range in cost from $10,000 to $70,000, with an average cost of $30,000, and AWEA indicates that "it is essential to have a site with unobstructed access to winds, which most often requires higher towers, larger land lots, and non-urban locations." *FAQ*

regional in nature than solar energy,[242] which increases the need for state and regional transmission considerations as opposed to the individual residential installations considered in solar access laws.[243] Many of the statutes and litigation addressing wind energy systems have less to do with the protection of the rights of the installer of the renewable energy system (as is the case with solar) and more to do with complaints by neighbors and environmental groups over avian impacts, noise complaints, aesthetic concerns, setback issues, and local government opposition to wind energy systems based on such citizen concerns.[244]

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for Small Wind Systems, AM. WIND ENERGY ASS'N, http://www.awea.org/documents/factsheets/Small_Wind_FAQ_Factsheet.pdf (last visited Jan. 21, 2011).

242. *See Wind Powering American: 80-Meter Wind Maps and Wind Resource Potential*, U.S. DEP'T OF ENERGY, http://www.windpoweringamerica.gov/wind_maps.asp (last visited Jan. 11, 2011) (demonstrating that average wind speed suitable for turbine installation varies throughout the United States).

243. *See Small Solar Electric Systems*, U.S. DEP'T OF ENERGY, http://www.energysavers.gov/your_home/electricity/index.cfm/mytopic=10710 (last visited Jan. 11, 2011) ("Because PV technologies use both direct and scattered sunlight to create electricity, the solar resource across the United States is ample for small electric systems.").

244. *See, e.g.*, Muscarello v. Ogle Cnty., 610 F.3d 416 (7th Cir. 2010) (rejecting property owner's takings claim and other challenges to county's approval of special use permit for windmills on adjacent property); Residents Opposed to Kittias Turbines v. State Energy Facility Site Evaluation Council, 197 P.3d 1153 (Wash. 2008) (affirming authority of State to preempt local zoning decision to deny permit to wind farm); Ten Taxpayer Citizens Group v. Cape Wind Assocs., 373 F.3d 183, 196 (Mass. 2004) (allowing for the construction of wind measuring devices off the coast of Massachusetts over the objections of environmental groups); Rankin v. FPL Energy L.L.C., 266 S.W.3d 506 (Tex. Ct. App. 2008) (rejecting nuisance claim filed by neighbors of proposed wind farm based on loss of view and noise complaints); *see also* Clark Cnty. Nev. v. Fed. Aviation Admin., 522 F.3d 437 (D.C. Cir. 2008) (finding that FAA had not performed proper review of wind farm and its effects on local airport); Christian v. Town of Riga, No. 08-CV-6557T, 2009 WL 63049 (W.D.N.Y. Jan. 6, 2009) (rejecting plaintiffs' constitutional claim based on city official's refusal to grant permit for residential windmill); Centerville's Concerned Citizens v. Town of Centerville, 867 N.Y.S.2d 626 (N.Y. App. Div. 2008) (rejecting changes in local zoning law that were not subject to proper state environmental review); Ecogen, L.L.C. v. Town of Italy, 438 F. Supp. 2d 149, 151 (W.D.N.Y. 2006) (stating that moratorium on wind energy development did not on its face violate developer's substantive due process rights despite the fact that moratorium was enacted after significant steps toward development had already occurred); Flint Hills Tallgrass Prairie Heritage Found. v. Scottish Power, P.L.C., No. 05-1025-JTM, 2005 WL 427503 (D. Kan. Feb. 22, 2005) (dismissing claim against wind developer on grounds that plaintiffs did not have private cause of action); Burch v. Nedpower Mount Storm, 647 S.E.2d 879 (W. Va. 2007) (allowing development of wind energy facility over local resident objections but providing that landowners could seek compensation for loss of property values); Finger Lakes Pres. Ass'n v. Town of Italy, 887 N.Y.S.2d 499 (N.Y. Sup. Ct. 2009) (dismissing residents' complaints relating to siting process and noise); Ctr. for Biological Diversity, Inc. v. FPL Group, Inc., 83 Cal. Rptr. 3d 588 (Cal. Ct. App. 2008) (rejecting environmental group claims on grounds that regulatory agency properly considered impacts on birds); Kerncrest Audubon Soc'y v. Los Angeles Dep't of Water & Power, No. F050809, 2007 WL 2208806 (Cal. Ct. App. Aug. 2, 2007) (dismissing challenge to wind farm based on state environmental review laws); Patricia E. Salkin & Ashira Pelman Ostrow, *Cooperative Federalism and Wind: A New Framework for Achieving Sustainability*, 37 HOFSTRA L. REV. 1049 (2009) ("[T]he intensity of local opposition has prompted one prominent energy siting consultant to remark that 'wind energy is fast becoming the mother of all NIMBY wars.'") (quoting Marty Durlin, Op-Ed., *Wind*

As with solar property rights, the wind easement is the most commonly recognized wind energy property right, but whereas thirty states have recognized some form of solar easement, only six states have enacted similar laws for wind.[245] Further, many statutes that have explicit descriptions of what must be contained in a solar easement have no such description for wind easements.[246] North Dakota, South Dakota, and Nebraska have addressed other property rights considerations by enacting laws that prevent the severing of wind rights from the surface estate.[247] The stated reason for the severance ban is to prevent large companies wishing to install turbines from taking advantage of land owners.[248]

Beyond recognizing individual easements and other property rights agreements, some states have embraced a statewide permitting and planning system for wind energy. As noted, some of the states with the highest wind capacity, such as Minnesota and Oregon, along with other states, like Washington, have replaced or supplemented local approvals with a statewide permitting process for some wind projects.[249] Michigan has avoided a traditional property rights approach to wind development and instead has adopted a broader land-use approach at the state level. The Clean, Renewable, and Efficient Energy Act[250] directed the Michigan Public Service Commission to create a Wind Energy Resource Zone Board to explore the potential for wind energy use in the state.[251] The Board consulted with local governments in order to carry out its task and issued a report detailing its findings in order to identify a wind energy resource zone as the most productive portion of the state to begin large

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Farms—Not in My Backyard, RUIDOSO NEWS (N.M.), Mar. 19, 2009, at A4 (statement of Bob Kahn, head of Strategic Communications, a Seattle-based firm that helps wind farms gain siting permits)); Girard P. Miller, *Developers See Green and Neighbors See Red: A Survey of Incentives and Mandates for the Development of Alternative Energy and the Unfolding Challenges*, 3 TEX. J. OIL, GAS & ENERGY L. 117, 139 (2008).

245. *See Rules, Regulations & Policies for Renewable Energy*, U.S. DEP'T OF ENERGY, www.dsireusa.org (last visited Jan. 11, 2011).

246. *See, e.g.*, MINN. STAT. § 500.3 (2010).

247. *See, e.g.*, NEB. REV. STAT. § 76-3004 (2010); N.D. CENT. CODE § 17-04-04 (2010); S.D. CODIFIED LAWS § 43-13-19 (2010).

248. *See* Matt Joyce, *As Wind Farm Plans Spread, Wyoming Considers Nature of Wind Rights*, BILLINGS GAZETTE, Oct. 4, 2009, *available at* http://billingsgazette.com/news/state-and-regional/wyoming/article_ec2dcedc-b0f4-11de-9aa2-001cc4c03286.html. Steven Wegman, Executive Director of the South Dakota Wind Energy Association, has stated, "if you sever the wind rights, you really have no control over the surface of the land." *Id*; *see also* JOINT REPORT OF THE SOUTH DAKOTA ENERGY INFRASTRUCTURE AUTHORITY AND THE SOUTH DAKOTA ENERGY TASK FORCE 60 (2005), *available at* http://files.sdwind.org/SDEIAReport_05.pdf.

249. *See supra* notes 234–40 and accompanying text.

250. *See* Michigan Public Act 295, MICH. COMP. LAWS §§ 460.1001–.1195 (2010).

251. *See* Mich. Public Service Comm'n Order U-15899 (Dec. 4, 2008).

scale wind development.[252] Finally, the Michigan legislature has created an expedited process for obtaining siting certificates for wind projects.[253]

Overall, the states that have been most active in creating substantive legislation on wind energy systems, as opposed to creating financial or tax incentives for wind energy, tend to fall into two main camps. The first camp consists of those states that have focused their legislation on creating or defining property rights in wind resources—wind easements—in order to facilitate private transactions and investment in wind energy systems. Those states include Montana, Nebraska, North Dakota, and South Dakota.[254] The second camp consists of those states that have supported increased wind development by creating statewide siting and permitting systems for wind energy systems above a certain size, some of which also preempt local zoning regulation for those systems.[255] These states include Connecticut, Minnesota, New Hampshire, Ohio, Rhode Island, and Vermont.[256] In states like Iowa, Texas, New York, Utah, and Illinois, the state legislatures have not officially recognized wind easements and any siting and permitting of wind energy systems takes place at the local level.[257]

For those states with no statewide siting and permitting process, there is a wide range of local regulation of wind energy systems of various sizes. For instance, Eldorado, California has a regulatory structure where larger wind energy facilities require a more lengthy approval process and more comprehensive documentation than is required for smaller facilities.[258] Some smaller, residential wind energy systems are permitted uses in certain areas of the city while larger systems require an administrative permit and even larger systems require a more complex conditional use permit, thus providing increased governmental scrutiny for larger systems.[259] Minimum lot size, setbacks, maximum turbine

252. *See* Clean Renewable and Efficient Energy Act, S.B. 213 § 147, 94th Leg., Reg. Sess. (Mich. 2008) (findings include modeling of wind energy conversion systems, as well as evaluation of existing systems).

253. *See id.* §§ 149–153.

254. *See infra* note 269 and accompanying table.

255. In those states that have a statewide system for siting and permitting wind energy systems over a certain size, local governments still engage in significant regulation of wind energy systems below that size. *See, e.g.*, Jim Anderson, *Afton Joins List of Cities Regulating Wind Turbines*, MINNEAPOLIS STAR-TRIBUNE, July 25, 2010, at B1 (reporting on the "crazy quilt of ordinances regulating residential wind turbines" in Minnesota).

256. *See infra* note 281 and accompanying table. Other states provide for centralized siting authority for larger facilities. *See infra* note 282 and accompanying table.

257. A review of the respective state statutes reveals that these state legislatures have not enacted wind easements or state level permitting.

258. *See* ELDORADO CNTY., CA., CODE art. 4, § 17.40.390 (2010).

259. *See id.*

height, and minimum separation distance also vary depending on the size of the system.[260]

In Iowa, one of the states with a large amount of installed wind power, only three counties[261] and two cities[262] have specific wind siting ordinances. Mason City, Iowa has banned commercial wind energy facilities (those facilities intended to produce electricity for sale at wholesale to utilities) and strictly regulates wind energy systems over 100 kilowatts.[263] Polk County, Iowa allows commercial wind energy systems upon receipt of a conditional use permit, which requires a special application process, informational conferences, and numerous levels of governmental approvals.[264]

In Illinois, Ogle County amended its ordinances in 2003 to allow wind energy systems in certain areas of the county upon receipt of a special use permit.[265] A wind development company sought approval for a special use permit to build wind turbines within the county and the county ultimately approved the permit, along with a "Home Sellers Property Value Protection Plan" to "provide a mechanism for residential property owners to recover any diminution in value that resulted from the windmills if and when they decided to sell their homes."[266] After the permit was approved a neighbor sued the county, the developers, and numerous other parties arguing the permit approval would deprive her of the full extent of "kinetic energy of the wind and air as it enters her property," that she would suffer from severe noise caused by the system, that the wind turbines would otherwise interfere with her use and enjoyment of her property, and that her property would be taken without just compensation in violation of the U.S. and Illinois Constitutions.[267] Although the Seventh Circuit dismissed all of the plaintiff's claims, in August 2010, Ogle County placed a moratorium on all wind facilities in the county, and is considering revising its ordinances to create setback requirements and noise pollution limits that industry representatives say would effectively preclude all wind energy systems in the county.[268]

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260. *See id.*

261. BOONE CNTY., IOWA ORDINANCE § 8.03 (2010); PLYMOUTH CNTY., IOWA, ORIDNANCE § 6.10 (2010); POLK CNTY., IOWA, ORDINANCE § 22.3 (2010).

262. *See* MASON CITY, IOWA, ORDINANCE §§ 12-33-1 to -33-8 (2010); WEST BURLINGTON, IOWA, ORDINANCE §§ 115.0–.12 (2010).

263. *See* MASON CITY, IOWA, ORDINANCE §§ 12-33-1 to -33-8 (2010).

264. *See* POLK CNTY., IOWA, ORDINANCE § 22.3 (2010).

265. *See* Muscarello v. Ogle Cnty., 610 F.3d 416, 418 (7th Cir. 2010).

266. *Id.* at 419.

267. *See id.* at 419–20.

268. *See id.* at 427; Sam Smith, *A Wind-Breaker in Ogle County?*, DAILY GAZETTE (Sterling, Illinois), Aug. 3, 2010 (reporting on proposed ordinance); Vinde Wells, *Temporary Hold on Wind Farms Approved*, OGLE NEWS, April 22, 2010.

Table 2 provides a summary of the various state statutes creating property rights in wind access and permitting frameworks for siting and approval. As the discussion and the chart illustrate, there is significant variation among states with regard to the recognition of property rights in wind access and whether the state or local government has primary authority for regulating and approving wind energy systems. Notably, as the Ogle County, Illinois example shows, local governments that attempt to encourage wind energy in their jurisdictions simply by adding it to an existing, more general special use permit framework can run into trouble with neighbor opposition. This issue could perhaps be avoided through a wind energy-specific, statewide permitting process that involves governmental agency expertise at both the state and local levels.

TABLE 2. STATE STATUTES ON WIND RIGHTS AND PERMIT SYSTEMS

Type of Statute	States
Allows Wind Easements	Minnesota, Montana, Nebraska, North Dakota, Oregon, and South Dakota have enacted wind easement statutes that allow for the creation of such easements.[269]
Invalidates Property Conveyance Limitations on Wind Energy Systems	Colorado, Delaware, Nevada, and Wisconsin declare void and unenforceable any property conveyance or agreement that prohibits wind energy systems.[270] Florida and Vermont prevent conveyances that limit the use of renewable energy generation devices.[271]
Invalidates Common Interest Community (Homeowner Association) Restrictions on Wind Energy Systems	Delaware and Nevada prevent common interest ownership associations from adopting regulations that unreasonably limit wind energy systems.[272]
Limits Local	California establishes maximum restrictions

269. *See* MINN. STAT. § 500.3 (2010); MONT. CODE ANN. § 70-17-303 (2010); NEB. REV. STAT. § 66-911.01 (2010); N.D. CENT. CODE § 17-04-06 (2010) (stating that the easement must include protections for neighboring property owners that the facility will not interfere with their use of their own property); OR. REV. STAT. §§ 105.900–.915 (2010); S.D. CODIFIED LAWS §§ 43-13-16 to -13-20 (2010).

270. *See* COLO. REV. STAT. § 38-30-168 (2010); DEL. CODE ANN. tit 29, § 8060 (West 2010); NEV. REV. STAT. § 111.239 (2010); WIS. STAT. § 236.292 (2010).

271. *See* FLA. STAT. § 163.04 (2010); VT. STAT. ANN. tit. 27, § 544 (2010).

272. *See* DEL. CODE ANN. tit. 29, § 8060 (West 2010); NEV. REV. STAT. § 116.2111(2)(c)(4) (2010).

Type of Statute	States
Government Restrictions on Wind Energy Systems	that can be placed on small wind systems or installations outside urban areas.[273] Illinois establishes maximum required setbacks.[274] Delaware, New Jersey, and Wisconsin prevent local government from adopting regulations that put unreasonable limits on wind energy systems or hinder their performance.[275] Michigan's Wind Energy Zoning Board expressly preempts local zoning authority in designated cases.[276] Florida prohibits ordinances that limit the use of energy generation from renewable resources.[277]
Creates Model Wind Ordinance for Local Governments	Maine, Massachusetts, Michigan, North Carolina, Pennsylvania, and South Dakota have promulgated model wind zoning ordinances.[278] New York provides a "Wind Energy Toolkit" for local governments.[279] Maryland created a model statute for siting small facilities on private lands.[280]
Creates Statewide	Connecticut, Minnesota, New Hampshire,

273. *See* CAL. GOV'T CODE § 65893 (West 2010).

274. *See* 55 ILL. COMP. STAT. 5 / 5-1202; 65 ILL. COMP. STAT. 5 / 11-13-26 (West 2010).

275. *See* DEL. CODE ANN. tit. 29, § 8060 (2010); Gen. Assemb. No. 3740, 213th Leg. (N.J. 2009).

276. *See* MICH. COMP. LAWS §§ 460.1141–.1161 (West 2010).

277. *See* FLA. STAT. § 163.04 (2010).

278. *See* Office of the Governor of Maine, Executive Order 31 FY 06/07 (establishing a task force which led to the production of a Model Wind Ordinance published by the Maine State Planning Office, available at http://www.maine.gov/spo/landuse/docs/ModelWindEnergyFacility Ordinance.pdf); DEP'T OF ENERGY RES. & MASS. EXEC. OFFICE OF ENVTL. AFFAIRS, MODEL AS-OF-RIGHT ZONING ORDINANCE OR BYLAW: ALLOWING USE OF WIND ENERGY FACILITIES (2009), available at http://www.mass.gov/Eoeea/docs/doer/gca/gc-model-wind-bylaw-mar-10-2009.pdf; MICH. DEP'T OF LABOR & ECON. GROWTH, SAMPLE ZONING FOR WIND ENERGY SYSTEMS (2008), available at http://www.michigan.gov/documents/dleg/WindEnergy SampleZoning_236105_7.pdf); N.C. WIND WORKING GRP., MODEL WIND ORDINANCE FOR WIND ENERGY FACILITIES IN NORTH CAROLINA (2008), available at http://www.ncsc.ncsu.edu/wind/wwg/publications/NC_Model_Wind_Ordinance_June_2008_FIN AL.pdf; PA. DEP'T OF ENVTL. PROT., MODEL ORDINANCE FOR WIND ENERGY FACILITIES IN PENNSYLVANIA, available at http://www.pennfuture.org/UserFiles/ModelWindOrdinance_ Final3_21_06_.pdf (last visited Jan. 11, 2011); S.D. PUB. UTIL. COMM'N, DRAFT MODEL ORDINANCE FOR SITING OF WIND ENERGY SYSTEMS (2008), available at http://puc.sd.gov/commission/twg/WindEnergyOrdinance.pdf.

279. See Wind Energy Toolkit, N.Y. STATE ENERGY RESEARCH AND DEV. AUTH., http://www.powernaturally.org/Programs/Wind/toolkit.asp (last visited Jan. 11, 2011).

280. See MD. ENERGY ADMIN., DRAFT MODEL SMALL WIND ORDINANCE FOR MARYLAND (2008), available at http://www.energy.state.md.us/documents/DraftModelSmall WindOrdinanceforMD_000.pdf.

Type of Statute	States
Siting Authority for Wind Energy Systems	Ohio, Rhode Island, and Vermont use a statewide siting and permitting process for most small and large wind energy systems.[281] A few other states use a statewide siting and permitting process only for larger, commercial wind energy systems over 60 MW.[282]

B. Proposed Solar and Wind Energy Development Frameworks

When the federal government first created a structure to facilitate development of natural resources such as land, minerals, and water in the nineteenth century, state permitting systems and local zoning largely did not exist.[283] As a result, courts and governmental entities focused on creating, defining, and conveying property rights in natural resources, both on and off federal lands, in order to encourage development of those resources with little regulatory control. As detailed in Part III.A,

281. See CONN. GEN. STAT. §§ 16-50g to -50hh (2010) (regulating statewide siting through the Connecticut Siting Council for facilities 1 MW or more fueled by renewable energy, though local zoning considerations may affect development); MINN. STAT. §§ 216F.01–.07 (2010) (siting all wind facilities greater than 5 MW through the Minnesota Public Utilities Commission and using a specific set of requirements drafted for wind energy facilities); N.H. REV. STAT. ANN. § 162-H:2 to -H:4 (2010) (regulating the installation of facilities over 30 MW through the New Hampshire Energy Siting Evaluation Committee, but allowing smaller facilities to opt in to state regulation to preempt local regulation); OHIO REV. CODE ANN. §§ 4906.01–.99 (West 2010) (regulating statewide siting of facilities 50 MW or more); R.I. GEN. LAWS § 42-98-1 to -20 (West 2010) (regulating state siting of facilities 40 MW or more); VT. STAT. ANN. tit. 30, § 248 (2010) (regulating state siting of all wind energy facilities except those for on-site energy consumption by the owner through the Vermont Public Service Board).

282. See ARIZ. REV. STAT. ANN. § 40-360 (2010) (providing for certificate of environmental compatibility for facilities 100 MW or more); MASS. GEN. LAWS ch. 164, § 69H (2010) (providing for statewide siting through the Energy Facilities Siting Board for any facility over 100 MW); N.C. GEN. STAT. § 62-110.1 (2010); N.D. CENT. CODE § 49-22-03 (2010) (defining an energy facility for purposes of state regulation as a facility greater than 60 MW); NEV. REV. STAT. §§ 704.820–.900 (2010) (providing for statewide siting of facilities greater than 150 MW through Nevada Public Utilities Commission); OR. REV. STAT. §§ 469.300–.441 (2010) (providing for statewide siting of wind power facilities 105 MW or more); S.D. CODIFIED LAWS § 49-41B (2010) (providing for statewide siting of wind energy facilities 100 MW or more); WASH. REV. CODE §§ 80.50.010–.904 (2010) (specifying siting of all facilities over 350 MW at the state level but allowing all renewable energy facilities that choose to be regulated by the State Energy Facility Site Evaluation Council to use the state process rather than the local permitting process).

283. Local governments did not embrace zoning on a widespread basis until the 1920s, and although there are examples of early state and local regulation of air and water pollution, it was not until the second half of the twentieth century that states began to adopt the comprehensive regulatory and permitting frameworks that exist today. *See, e.g.*, DAVID L. CALLIES ET AL., CASES AND MATERIALS ON LAND USE 20–21, 33 (5th ed. 2008) (discussing the rise of local zoning in the United States); ROBERT E. PERCIVAL ET AL., ENVIRONMENTAL REGULATION 88–91 (6th ed. 2009) (discussing history of local, state, and federal environmental regulation).

courts often had difficulty balancing natural resource development rights with changing needs, particularly as the nation grew and environmental and pollution control concerns became increasingly pressing. Indeed, these interests were not significantly rebalanced until the environmental movement of the 1960s and 1970s, which ushered in a host of new pollution control laws and created the field of environmental law, fundamentally changing the field of natural resources law.

Since the 1970s, the pollution control model has significantly overlaid the natural resource development model, and, in some cases, completely replaced it with a centralized system of resource development that is based on permit issuance rather than property rights and that attempts to balance local, state, and federal regulation in order to address pollution control, siting, development, and economic concerns that exist at each of those levels.[284] Although in some areas the government has experimented with cap and trade systems and other forms of property-based exchanges to meet environmental protection goals,[285] the pollution control model continues to dominate.

The federal government has so far declined to regulate solar and wind energy development on private lands. Instead, the federal government has provided funding and incentives to private parties, states, and local governments, and has studied and planned for large-scale solar and wind development on public lands.[286] Many states have also declined to follow a centralized permitting model at either the state or local level. State governments have instead enacted legislation that prevents local interference with solar or wind energy systems and that recognizes private property rights in solar and wind access in order to encourage development. Other states, particularly in regards to wind energy systems over a certain size, have embraced the pollution control model in the form of statewide planning and zoning, taking authority away from local governments, and focusing less on a property rights model. Recently, scholars writing in the area of solar and wind energy have tended to encourage lawmakers to focus on the property rights model, often looking to water law or oil and gas law as a model, in order to spur development of renewable energy.[287]

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284. *See supra* Part II.B.

285. *See* RUHL ET AL., *supra* note 26, at 240–41.

286. *See supra* Part I.B; *supra* note 14 (discussing solar and wind projects on public lands).

287. *See* Bronin, *supra* note 73, at 884–86 (advocating for using existing property forms, drawing on principles of water law, among other approaches, to allocate solar rights); Rule, *supra* note 74, at 211 (arguing that the Calabresi and Melamed "Rule Four" should be used to resolve conflicts between landowners of competing wind rights); Alexander, *supra* note 56, at 33–34 (arguing that Texas should enact a statute clarifying that wind is a natural resource similar to oil, natural gas, and water and that it should be severable from the surface estate).

Although many wind easement statutes were modeled after existing solar statutes, development of solar and wind are arguably sufficiently different to recommend different regulatory and property-based approaches. Indeed, the variety of actions that state and local governments have taken in regard to solar and wind differ quite markedly, as evidenced in the earlier analysis in Part III.A. Taking account of the different challenges posed by each of these technologies, this subpart proposes alternative solar and wind energy development models.

1. Proposed Solar Energy Development Model

A significant percentage of solar development on private lands is on a neighborhood or house-by-house basis,[288] which means that local land use and zoning structures may best address the concerns of individuals who would use solar energy, as well as the concerns of their neighbors, and the needs of the local community. Because of variations in lot size, solar access, and type of community, perhaps the optimal role for states, and certainly the federal government, is to ensure that local governments do not unduly interfere with individual solar development, to provide model ordinances, and to encourage local governments to create zoning ordinances that provide some certainty that solar power will remain a viable resource for a potential installer. In that regard, Boulder, Colorado appears to be a model by creating solar "fences" and "envelopes" that provide all parties with some certainty regarding what is and is not allowed for solar installations, building height and location, and vegetation.[289]

On the other hand, a forced easement conveyance system, such as exists in Iowa, may run risks that outweigh any benefits associated with greater solar development in the short term. Although Iowa has a process by which a servient landowner can petition an administrative agency or court to remove the easement if the solar collector system is not installed or is abandoned within a certain period of time, such a forced easement system still may result in creating fixed property rights that become obsolete or must be reconfigured to address changing energy needs,

288. *See About Solar Energy: Industry Data*, SOLAR ENERGY INDUSTRIES ASSOC., http://www.seia.org/cs/about_solar_energy/industry_data (last visited Jan, 22, 2011) ("At year end 2009, the U.S. had 2,108 megawatts (MW) of installed solar electric capacity. This included about 1,676 MW of photovoltaics (PV), 432 MW of utility-scale concentrating solar power, at least 24,000 MW (megawatts thermal equivalent) of solar water heating, cooling, and solar pool heating systems.").

289. *See supra* note 191 and accompanying text.

technology development, or transmission development.[290] Moreover, the systems in place in New Mexico, Wyoming, and Wisconsin modeled after the prior appropriation doctrine in water rights would appear to run the risk of a race to develop solar energy in particular locations in order to lock those rights in place, even if the solar system erected ultimately is not in the best location for future solar development or interferes with later solar land use planning along the lines of the Boulder, Colorado approach. Because of these drawbacks, a better approach for residential solar may be to simply recognize solar easements, allow private transactions, eliminate local zoning and common interest community restrictions on solar panel use, and create solar land use planning in those communities, like Boulder, that may want a more comprehensive approach, but avoid first-in-time permitting systems that lock in existing uses over future uses.

Indeed, the early mining and water law cases discussed in Part II, placed against the backdrop of the environmental movement of the 1960s and 1970s, shows that a system based on a first-in-time allocation of property rights in nature created significant roadblocks to later efforts to respond to changing needs until significant resource depletion and environmental harm had already occurred. For example, as discussed in Part II, the prior appropriation system of conveying and allocating rights to water use, which was developed to encourage construction of water diversion projects for agricultural and economic development, is not well-suited to resolving today's conflicts between traditional water use and the desire to leave water in place for conservation and species protection purposes.[291] While both courts and legislatures at the state level have attempted to respond to this problem by recognizing instream appropriations as a beneficial use, the process has taken many decades, is incomplete, and exists only as a partial overlay on a very entrenched property-rights based system.[292]

2. *Proposed Wind Energy Development Model*

Creating a structure to best facilitate wind energy systems may require a different approach from solar energy development. Wind turbines are significantly larger than most residential and commercial solar panels and often have more extensive impacts on birds, aesthetics, and neighbors than solar projects on private lands.[293] As a result, there

290. *See* IOWA CODE ANN. § 564A.6 (2010) (providing for removal of easement); *see also* Julia D. Mahoney, *Perpetual Restrictions on Land and the Problem of the Future*, 88 VA. L. REV. 739 (2002) (discussing problems with creating perpetual conservation easements).

291. *See supra* notes 147–49 and accompanying text.

292. *See id.*

293. *See supra* note 244 (referencing widespread litigation over wind turbines).

appears to be a greater role for state agencies with expertise to exercise authority with regard to siting and permitting projects on private or public lands, in much the same way that state and federal environmental agencies exercise authority over air emissions, pollutant discharges to water, or impacts to endangered species.

State legislative activity in the area of wind energy development appears to be split between a natural resource development model and a pollution control model in order to facilitate wind development while also addressing related environmental and neighboring landowner concerns. Some states, like Montana, North Dakota and South Dakota, have focused on creating property rights to facilitate development, thus following the early natural resource development model. Notably, these states have a long history of relying on natural resource development as a key part of their economies. By contrast, many of the states that have focused on creating statewide permitting and siting legislation are following the pollution control model of using regulation and a permitting system to allow development, but with limits and conditions to meet environmental, public health, and safety goals. Some of these states, particularly Minnesota, Vermont, and Connecticut, have a history of creating significant state permitting and regulatory authority to meet environmental protection goals and also have been at the forefront of statewide and regional land use planning.[294]

These categories are far from perfect, but it does appear that states that have historically avoided significant statewide permitting for pollution control matters have avoided significant statewide permitting for wind energy systems, while those states that have historically embraced significant statewide planning for pollution control matters have embraced significant statewide permitting for wind energy systems. Thus, the differences between the natural resource development model focused on creating and conveying property rights, and the pollution control model, focused on federal or statewide permitting, continue to manifest themselves today in state wind energy legislation.

For wind, the better approach may be for more states to go beyond creating property rights in wind access and develop state-wide permitting systems, at least for large wind energy facilities, that can take into account state-wide siting and environmental concerns. There should still be some role for local government involvement, as there is in most states with existing permitting systems, but states should provide oversight so that local governments cannot completely block wind development in their jurisdictions as a result of local political pressure. Of course, state

294. *See, e.g.*, DAVID L. CALLIES ET AL., CASES AND MATERIALS ON LAND USE 768–69 (5th ed. 2008) (including Connecticut and Vermont as states that have adopted statewide land use controls).

permitting schemes, like local zoning structures, are not without their own potential problems. Permitting at both the state and local level may be subject to undue influence by interests that have aesthetic concerns or oppose restrictions on development placed on properties located near proposed wind or solar energy systems. Likewise, both state and local permitting and zoning frameworks that limit nearby development projects may be subject to takings challenges by neighbors upset by new limits on their ability to develop their property.[295] This issue has come up recently in the case of local zoning that creates height and use restrictions on properties near airports; landowners in some of these cases have argued successfully that such regulation constitutes a regulatory or physical taking requiring just compensation.[296] There are certainly ways to avoid or minimize these problems by ensuring that new limits on use do not reduce property values below a certain amount or, in some cases, by providing a mechanism for just compensation by either the government regulatory authority or by the wind or solar developer.[297] In the end, however, the scale of wind projects themselves as well as the state-wide concerns associated with wind-related environmental and siting challenges argue in favor of a greater emphasis on a state-wide system of permitting for large wind projects than is the case for solar projects on private lands.

CONCLUSION

History is always valuable in attempting to avoid the mistakes of the past and thus some caution with regard to a strong focus on property

295. *See, e.g.*, Bronin, *supra* note 56, at 1241–50 (discussing potential takings challenges to state permitting regimes for solar energy development but finding fewer takings concerns associated with local zoning frameworks).

296. *See, e.g.*, McCarran Int'l. Airport v. Sisolak, 137 P.3d 1110 (Nev. 2006) (finding that county zoning ordinance placing height restrictions on plaintiff's property near airport and allowing presence of aircraft over plaintiff's property below 500 feet constituted a per se regulatory taking under the Nevada Constitution and the Fifth Amendment based on *Loretto v. Teleprompter CATV Corp.*, 458 U.S. 419 (1982)); *see also, e.g.*, Vacation Village v. Clark County, 497 F.3d 902 (9th Cir. 2007) (applying *Sisolak* case in challenge by another landowner to same county ordinance at issue in *Sisolak* and finding that while the ordinance constituted a taking under Nevada law, it did not constitute a taking under federal law); DeCook v. Rochester Airport Joint Zoning Bd., No. A09-969, 2010 WL 1850268 (Minn. Ct. App. May 11, 2010) (finding airport zoning ordinance that placed building-height restrictions on plaintiffs' property constituted a regulatory taking under the Minnesota and U.S. Constitutions even though diminution in property value caused by the ordinance was only a small percentage of the value of the property), *review granted* June 29, 2010 (West KeyCite feature).

297. *See, e.g.*, Muscarello v. Ogle County, 610 F.3d 416 (7th Cir. 2010) (noting that county framework for granting special use permits for wind farms included a "property value protection plan" for residential property owners to recover any diminution in value that resulted from the turbines if and when they decided to sell their homes); IOWA CODE ANN. §§ 564A.7.1–.7.9 (2010) (authorizing local regulatory boards to create involuntary solar easements upon payment of compensation to servient estate owner).

rights for solar and wind development may be in order. Just as in the past, property rights are once again being employed to promote natural resource development and economic development, albeit this time in part to address environmental harms caused by climate change. Policymakers and scholars would be wise to look not only to mining and water law as models for encouraging renewable energy development, but also to the role local and, even more importantly, state government can play in providing expertise, creating zoning and permitting systems to facilitate solar and wind development, and ensuring local governments or common interest communities do not enact rules or legislation that interfere unduly with solar or wind development.[298] The examples of mineral development and water rights, as shown in Part II, highlight how problems arise when entrenched property rights are created to foster economic and industrial development that trump all other interests.[299]

Ultimately, it is important to consider the history of natural resource development as well as the rise of the pollution control and permitting statutes of the 1970s and 1980s in analyzing today's efforts to develop renewable energy. Because of the parallels regarding the need for incentives to spur development, it can sometimes be too easy to look to the historical natural resource development model with its emphasis on creating and protecting resource development rights as the obvious path to renewable energy development. But efforts to encourage renewable energy must be placed in the larger context of both climate change and the development of the pollution control model and its present-day overlay on natural resource development law. If policymakers and scholars can draw on the full history of natural resource development and pollution control regimes in considering approaches to renewable energy, it may be possible to facilitate access to solar and wind resources without creating unnecessary and entrenched property rights in those resources and repeating the mistakes of the past.[300]

298. *See* Alexandra B. Klass, *Climate Change and Reassessing the "Right" Level of Government: A Response to Bronin*, 93 MINN. L. REV. HEADNOTES 15 (2009).

299. *See supra* Part II.B.